ARIS SUMMARY SHEET

District Geologist, Victoria   Off Confidential: 90.01.30

ASSESSMENT REPORT 18672   MINING DIVISION: Nanaimo

PROPERTY: North Texada
LOCATION: LAT 49 45 00   LONG 124 34 00
UTM 10 5511794 387139
NTS 092F15E 092F10E

CAMP: 028 Texada Island

CLAIM(S): Yew,Golden Rod,Linden,Bar,Mag,Gold,Cortez,Ed,Humak,Eagle,Bolivar
Mountain Chief (L.55),Silver Tip (L.44),Nancy Bell (L.46)
Columbia (L.58)
OPERATOR(S): Echo Bay Mines
AUTHOR(S): Sarjeant, P.T.
REPORT YEAR: 1989, 96 Pages
COMMODITIES
SEARCHED FOR: Gold,Silver,Iron,Copper
KEYWORDS: Triassic,Quatsino Formation,Limestone,Karmutsen Formation
Volcanics,Jurassic,Intrusives,Faults,Skarns,Chalcopyrite,Magnetite
Gold
WORK
DONE: Geological,Geophysical,Geochemical,Physical
GEOL 800.0 ha
Map(s) - 5; Scale(s) - 1:20 000,1:5000,1:1000,1:500
LINE 24.0 km
MAGG 21.0 km
Map(s) - 6; Scale(s) - 1:1000
ROCK 298 sample(s) ;ME
MINFILE: 092F

ASSESSMENT REPORT

GEOLOGICAL AND GEOPHYSICAL SURVEYS ON THE NORTH TEXADA PROPERTY

NORTH TEXADA ISLAND
British Columbia

Property Location:
Latitude 49° 50' North
Longitude 124°' 34' West
NTS 92F/15

Prepared for:

ECHO BAY MINES LTD.

Report prepared by:

Paul T. Sarjeant

April, 1989

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1. SUMMARY

On May 5, 1988 Echo Bay Mines entered into a joint venture agreement with Rhyolite Resources Inc. to perform exploration work on a package of ground known as the North Texada Joint Venture. The primary target was gold skarn mineralization within the Quatsino Limestones, and associated with both the Karmutsen Group volcanics and the Island Intrusive suite of diorites and monzonites. Of secondary interest were the shear hosted vein deposits with known gold mineralization confined within the Karmutsen Volcanics.

Considerable exploration work has been carried out on the island by various workers and the volume of data necessitated an overall review and compilation of the material. Much of this past summer's work focused on locating and resampling old known showings, as well as locating and mapping new showings.

Mapping and prospecting at 1:5000 scale was carried out on the volcanic terrain referred to as the Surprise Mountain area. Old prospects were tested by minor trenching and channel sampling to confirm reported values.

Portions of grids in the M-21 and Paris Mine areas were reconstructed. Mapping of the M-21 and Yew grids was carried out at 1:1000 scale; 21 line kilometers of total field magnetometer surveying was also carried out. The old Paris Mine site was mapped at a 1:500 scale; old trenches crossing the skarn zone were cleaned and resampled.

Previous magnetic data was reprocessed using 'in house' computers for use at metric scales.

2. PROPERTY HISTORY

Texada Island has a long and colorful mining history which dates back to the late 1800's when miners and prospectors first discovered gold in volcanic hosted quartz veins on Surprise Mountain. Further discoveries of gold and copper led to the development of several mines at the turn of the century. Table 1 lists the reported statistics for the various mines on the island. The largest producer was the Texada Iron Mine (in operation until 1977) which produced in the order of 10 million tons of iron ore concentrate and 1,897 ounces of gold. The Marble Bay Mine, a copper-gold skarn, was the largest producer of gold on the island. From 1899 to 1929 314,200 tons of ore were produced and 50,001 ounces of gold recovered. Historical production from these past producers is more than 105,000 ounces of gold.

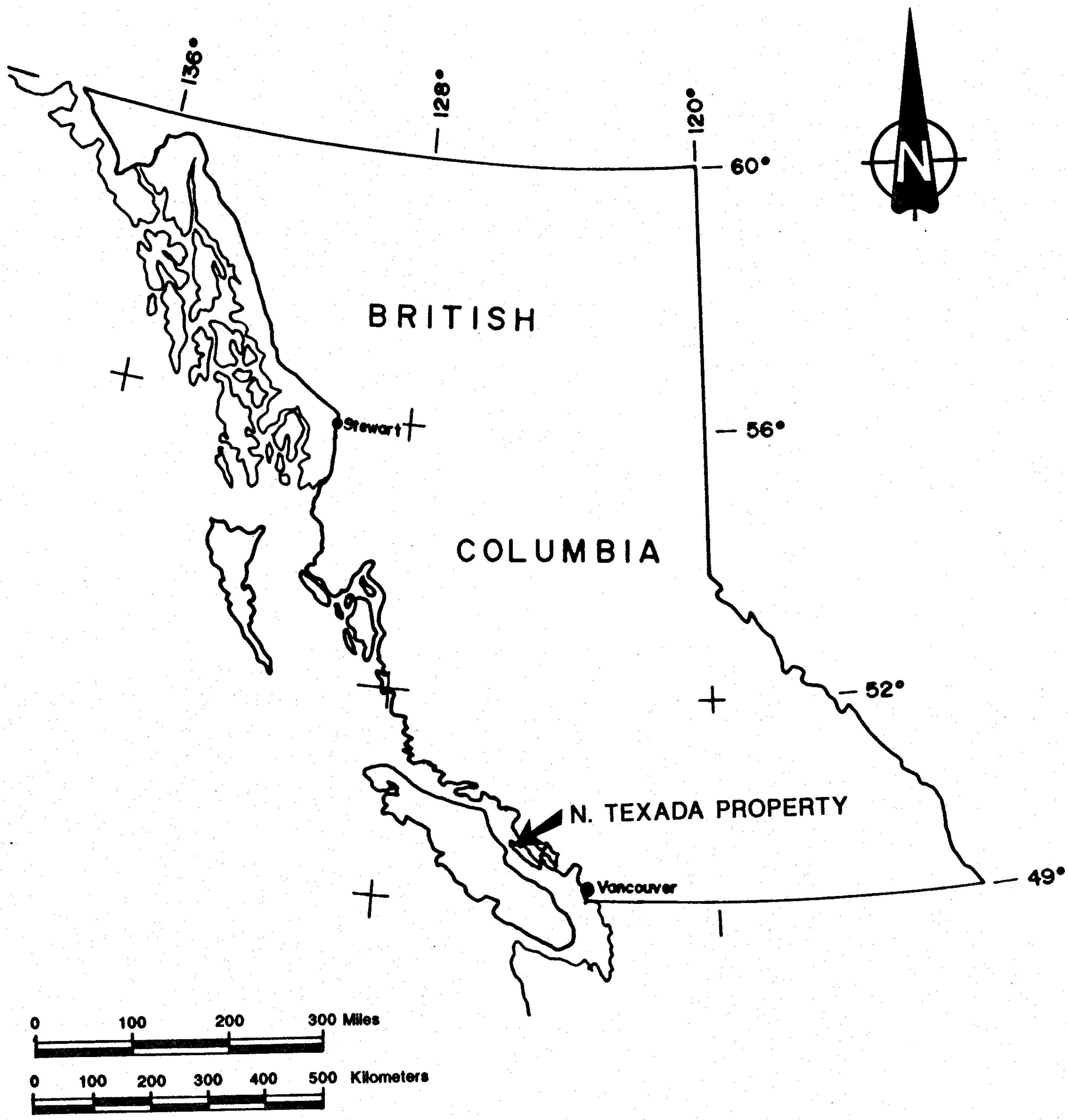
Little work was carried out during the mid 1900's but exploration activities were renewed in the early 1970's and continues to this day. Many players have worked on the various showings and deposit types. A historical summary of this work can be found in the bibliography.

Rhyolite Resources Inc. have put together a contiguous package of claims which covers the northern end of Texada Island and is known as the North Texada Joint Venture

3. LOCATION AND ACCESS

The claims are located on the northern end of Texada Island approximately 120 air kilometers northwest of Vancouver (Fig 1). The property is located in the Nanaimo Mining District and can be found on NTS map sheet 92F/15.

Access to the island is by air or land via ferry. Local air charter operators fly directly to Gillies Bay on Texada



LOCATION MAP

FIGURE 1

Island and to Powell River on the mainland. Ferry service from Powell River runs continuously throughout the day. Surface access from Vancouver is via highway #101 and the B.C. Ferries system to Powell River. This trip takes the better part of a day to travel.

Access to showings on the island is excellent with a well developed system of secondary and logging roads.

4. CLAIM DATA

At present the North Texada Joint Venture comprises 120 claims and/or fractional claims, and 25 crown grants (Fig 2). The following table lists these claims and crown grants according to grouping titles.

North Texada Joint Venture Claim Group

ECHO BAY MINES LTD. YEW GROUP N. TEXADA

CLAIM NAME	RECORD #	CLAIM SIZE	CLAIM UNIT	STAKE DTE	EXPIRY DTE	OWNER
FIR FR	1299	1.00	UNITS	1983/01/10	1989/01/10	RHYOLITE
YEW	1987	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW 2	1988	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW 3	1989	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW 4	1990	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW 5	1991	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW 6	1992	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW 7	1993	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW 8	1994	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW FR	1995	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW FR 2	1996	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
YEW FR 4	1998	1.00	UNITS	1985/01/31	1989/01/31	RHYOLITE
AJAX FR	2727	1.00	UNITS	1987/07/02	1989/07/02	J.E. NEWMAN
GOLDEN ROD	662	1.00	UNITS	1980/07/15	1989/07/15	RHYOLITE
GOLDEN ROD 2	661	1.00	UNITS	1980/07/15	1989/07/15	RHYOLITE
GOLDEN ROD FR	663	1.00	UNITS	1980/07/15	1989/07/15	RHYOLITE

ECHO BAY MINES LTD. YEW GROUP N. TEXADA

CLAIM NAME	RECORD #	CLAIM SIZE CLAIM UNIT	STAKE DTE	EXPIRY DTE	OWNER
LINDEN FR	1016	1.00 UNITS	1981/10/13	1989/10/13	RHYOLITE
LINDEN FR 2	1017	1.00 UNITS	1981/10/13	1989/10/13	RHYOLITE
LINDEN	1018	1.00 UNITS	1981/10/13	1989/10/13	RHYOLITE
LINDEN 2	1019	1.00 UNITS	1981/10/13	1989/10/13	RHYOLITE
YEW FR 7	3203	1.00 UNIT	1988/12/09	1989/12/09	ECHO BAY MINES LTD.
YEW 9	3241	1.00 UNIT	1989/02/15	1990/02/15	ECHO BAY MINES LTD.
YEW 10	3242	1.00 UNIT	1989/02/15	1990/02/15	ECHO BAY MINES LTD.
TEX	1333	16.00 UNITS	1983/03/08	1990/03/08	RHYOLITE
ADA	1334	12.00 UNITS	1983/03/08	1990/03/08	RHYOLITE
ADA FR	2115	1.00 UNITS	1985/04/12	1990/04/12	RHYOLITE
GABRIOLA FR (TEXADA)	37596	1.00 UNIT	1974/06/17	1992/06/17	RHYOLITE
LEONARD	37600	1.00 UNIT	1974/06/17	1992/06/17	RHYOLITE
PRIEST	37601	1.00 UNIT	1974/06/17	1992/06/17	RHYOLITE
CADET-KEY FR	37602	1.00 UNIT	1974/06/17	1992/06/17	RHYOLITE
LAP NO. 8 FR	37597	1.00 UNIT	1974/06/17	1992/06/17	RHYOLITE
LAP NO. 7 FR	37598	1.00 UNIT	1974/06/17	1992/06/17	RHYOLITE
GLADYS C	37599	1.00 UNIT	1974/06/17	1992/06/17	RHYOLITE
MARBLE BAY FR 2	38033	1.00 UNIT	1975/01/03	1993/01/03	RHYOLITE
SNO	38025A	1.00 UNIT	1975/01/23	1993/01/23	RHYOLITE
MARJORIE	37732	1.00 UNIT	1974/09/09	1993/09/09	RHYOLITE
BIRCH	37906	1.00 UNIT	1974/11/07	1993/11/07	RHYOLITE
BAR 5	37934	1.00 UNIT	1974/11/15	1993/11/15	RHYOLITE
BAR 6	37935	1.00 UNIT	1974/11/15	1993/11/15	RHYOLITE
MAG 1	37933	1.00 UNIT	1974/11/18	1993/11/18	RHYOLITE
MAG 2	37936	1.00 UNIT	1974/11/18	1993/11/18	RHYOLITE
MAG 3	37937	1.00 UNIT	1974/11/18	1993/11/18	RHYOLITE
MAG 4	37938	1.00 UNIT	1974/11/18	1993/11/18	RHYOLITE
MAG 5	37939	1.00 UNIT	1974/11/18	1993/11/18	RHYOLITE
GEM	118	1.00 UNIT	1976/10/01	1994/10/01	RHYOLITE

ECHO BAY MINES LTD. CORTEZ GROUP

CLAIM NAME	RECORD #	CLAIM SIZE	CLAIM UNIT	STAKE DTE	EXPIRY DTE	OWNER
CB	2666	9.00	UNITS	1987/05/15	1989/05/15	RHYOLITE
MP	2667	4.00	UNITS	1987/05/15	1989/05/15	RHYOLITE
JON	3205	1.00	UNIT	1988/12/03	1989/12/03	ECHO BAY MINES LTD.
ECHO	3206	1.00	UNIT	1988/12/03	1989/12/03	ECHO BAY MINES LTD.
RICHARD	3208	1.00	UNIT	1988/12/04	1989/12/04	ECHO BAY MINES LTD.
PAUL FR	3209	1.00	UNIT	1988/12/04	1989/12/04	ECHO BAY MINES LTD.
PAUL	3207	1.00	UNIT	1988/12/04	1989/12/04	ECHO BAY MINES LTD.
RICHARD 2	3210	1.00	UNIT	1988/12/08	1989/12/08	ECHO BAY MINES LTD.
JON 2	3243	1.00	UNIT	1989/02/14	1990/02/14	ECHO BAY MINES LTD.
BAY	1336	1.00	UNITS	1983/03/08	1990/03/08	RHYOLITE
GOLD 1	1337	1.00	UNITS	1983/03/08	1990/03/08	RHYOLITE
GOLD 2	1338	1.00	UNITS	1983/03/08	1990/03/08	RHYOLITE
CORTEZ	37611	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 2	37612	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 3	37613	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 4	37614	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 7	37615	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 8	37616	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 9	37617	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 10	37618	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 11	37621	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 12	37622	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 13	37623	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 14	37624	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 15	37625	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 16	37626	1.00	UNIT	1974/06/27	1990/06/27	RHYOLITE
CORTEZ 5	37619	1.00	UNIT	1974/07/02	1990/07/02	RHYOLITE
CORTEZ 6	37620	1.00	UNIT	1974/07/02	1990/07/02	RHYOLITE
ED 1	37634	1.00	UNIT	1974/07/02	1990/07/02	RHYOLITE
ED 2	37635	1.00	UNIT	1974/07/02	1990/07/02	RHYOLITE
ED 3	37636	1.00	UNIT	1974/07/02	1990/07/02	RHYOLITE
ED 4	37760	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE
ED 5	37761	1.00	UNITS	1974/09/20	1991/09/20	RHYOLITE
ED 6	37762	1.00	UNITS	1974/09/20	1991/09/20	RHYOLITE
ED 7	37763	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE

ECHO BAY MINES LTD. CORTEZ GROUP

CLAIM NAME	RECORD #	CLAIM SIZE	CLAIM UNIT	STAKE DTE	EXPIRY DTE	OWNER
ED 8	37764	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE
ED 9	37765	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE
ED 10	37766	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE
ED 11	37767	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE
ED 12	37768	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE
ED 13	37769	1.00	UNIT	1974/09/20	1991/09/20	RHYOLITE
ED 14	37940	1.00	UNIT	1974/11/15	1991/11/15	RHYOLITE
ED 15	37941	1.00	UNIT	1974/11/15	1991/11/15	RHYOLITE
ED 16	37942	1.00	UNIT	1974/11/15	1991/11/15	RHYOLITE
ED 17	37943	1.00	UNIT	1974/11/15	1991/11/15	RHYOLITE
ED FR 1	37959	1.00	UNIT	1974/12/12	1991/12/12	RHYOLITE
HUMAK	220	1.00	UNIT	1978/03/21	1992/03/21	RHYOLITE
HUMAK A	244	1.00	UNIT	1978/05/23	1992/05/23	RHYOLITE
HUMAK B	245	1.00	UNIT	1978/05/23	1992/05/23	RHYOLITE
IRISH 1	37706	1.00	UNIT	1974/08/20	1993/08/20	RHYOLITE
EAGLE 1	37884	1.00	UNIT	1974/10/28	1993/10/28	RHYOLITE
EAGLE 2	37885	1.00	UNIT	1974/10/28	1993/10/28	RHYOLITE
EAGLE 3	37886	1.00	UNIT	1974/10/28	1993/10/28	RHYOLITE
EAGLE 4	37887	1.00	UNIT	1974/10/28	1993/10/28	RHYOLITE
IRISH 2A	42	1.00	UNIT	1975/11/21	1993/11/21	RHYOLITE
BOLIVAR 24	37971	1.00	UNIT	1974/12/23	1993/12/23	RHYOLITE
BOLIVAR 101	37987	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 102	37988	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 103	37989	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 104	37990	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 105	37991	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 106	37992	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 107	37993	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 112	37994	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 113	37995	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 114	37996	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 115	37998	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 116	37999	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 117	38002	1.00	UNITS	1974/12/30	1993/12/30	RHYOLITE

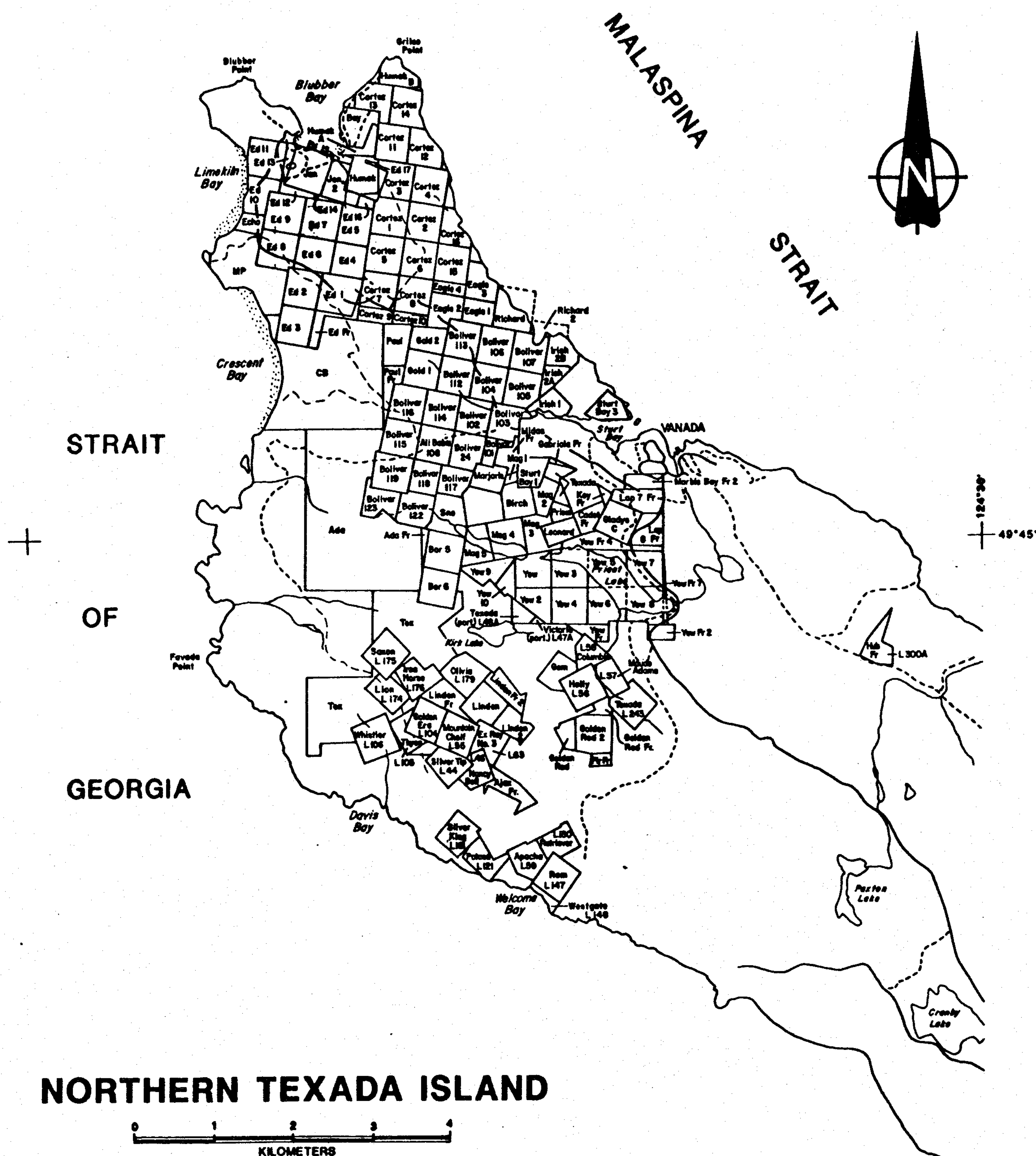
ECHO BAY MINES LTD. CORTEZ GROUP

CLAIM NAME	RECORD #	CLAIM SIZE CLAIM UNIT	STAKE DTE	EXPIRY DTE	OWNER
BOLIVAR 118	38003	1.00 UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 119	38004	1.00 UNITS	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 122	38000	1.00 UNIT	1974/12/30	1993/12/30	RHYOLITE
BOLIVAR 123	38001	1.00 UNIT	1974/12/30	1993/12/30	RHYOLITE
ALI BABA 108	37997	1.00 UNIT	1974/12/30	1993/12/30	RHYOLITE
IRISH 28	43	1.00 UNIT	0000/00/00	1995/11/21	RHYOLITE

N. TEXADA - CROWN GRANTS

CLAIM NAME	RECORD #	CLAIM SIZE CLAIM UNIT
CG POTASA	LOT121	1.00 UNITS
CG HUB FR	LOT300A	1.00 UNIT
CG SILVER KING	LOT181	1.00 UNIT
CG MOUNTAIN CHIEF	LOT55 *	1.00 UNIT
CG SILVER TIP	LOT44 *	1.00 UNIT
CG VICTORIA PORTION	LOT47A	1.00 UNIT
CG NANCY BELL	LOT46 *	1.00 UNIT
CG TEXADA PORTION	LOT48A	1.00 UNIT
CG EX RAY 3	LOT63 *	1.00 UNIT
CG MAUDE ADAMS	LOT57	1.00 UNIT
CG COLUMBIA	LOT58 *	1.00 UNIT
CG THYEE	LOT105	1.00 UNIT
CG WHISTLER	LOT106	1.00 UNIT
CG GOLDEN ERA	LOT104	1.00 UNIT
CG OLIVIA	LOT179	1.00 UNIT
CG IRON HORSE	LOT176	1.00 UNIT
CG SAXON	LOT175	1.00 UNIT
CG LION	LOT174	1.00 UNIT
CG TEXADA	LOT243	1.00 UNIT
CG MIDAS FR	LOT215	1.00 UNIT
CG STURT BAY 1	LOT158	1.00 UNIT
CG STURT BAY 3	LOT160	1.00 UNIT
CG APACHA	LOT59	1.00 UNIT
CG HOLLY	LOT56	1.00 UNIT
CG RAM	LOT147	1.00 UNIT
CG WESTGATE	LOT148	1.00 UNIT
CG RETRIEVER	LOT150	1.00 UNIT

* Part of Yew Group of claims



CLAIM MAP

FIGURE 2

4. REGIONAL GEOLOGY

Vancouver Island and Texada Island are underlain by Upper Paleozoic and Lower Mesozoic sedimentary and volcanic units. Sicker Group (limestones and cherts) rocks represent the Upper Paleozoic and occur at the southern end of Texada Island. An unconformity(?) marked by a suite of dykes and sills of gabbro plus minor peridotite exists between the Sicker Group and overlying volcanics. Muller et.al. (1969) believes these intrusions are comagmatic with Karmutsen volcanic rocks.

Vancouver Group rocks dominate the map area. The group is divided into three main divisions; 1) a lower volcanic package of Upper Triassic age called the Karmutsen Formation; 2) a middle group of massive limestones of Upper Triassic age known as the Quatsino Limestones; 3) an upper division composed of a lower sedimentary package and an upper volcanic package called the Bonanza subgroup.

Mid to Upper Jurassic Island Intrusives intrude the previously mentioned units. The Island Intrusives are granodiorite to quartz diorite in composition with less common quartz monzonites also present.

Early structures documented by Carlisle and Suzuki (1965) indicate that folding and faulting took place prior to the emplacement of the Island Intrusives. Folding is believed to be a result of movement along north trending vertical fault zones. Strong northwest structures are developed in the Island Intrusives and are therefore of Middle Mesozoic age. A major unconformity separates the Vancouver Group from the Upper Triassic and Lower Cretaceous Nanaimo Group. Tertiary (?) faults and dykes trending 290 degrees are less altered than the Mesozoic northwest structures and are believed to be the youngest structural event in the region (Muller et. al. 1969).

5. PROPERTY GEOLOGY

Texada Group volcanics (correlative with Karmutsen volcanics on Vancouver Island) underlie the southwest portion of the property. Predominantly basaltic, Texada Group stratigraphy consists of feldspar phyric, fine grained massive, and pillowed flows, tuffaceous and/or agglomerate horizons, and subvolcanic sills. This stratigraphy strikes northwesterly and both youngs and dips shallowly to the northeast; there is no evidence of folding. The Texada Group is best exposed in the Surprise Mountain area of the property. Limestone interbeds are common within the upper part of the volcanics package; the unit overlies a feldspar phyric basalt and is in turn overlain by pillowed basalts on Surprise Mountain. Fossils date the Intraformational Limestone Unit as Upper Karnian (Muller et.al. 1969). The volcanic package is metamorphosed to pumpellyite-subgreenschist facies as evidenced by the occurrence of chlorite, carbonate and pumpellyite and quartz in amygdales (Muller et.al. 1969).

The Quatsino Limestone, locally known as the Marble Bay Formation, conformably overlies the Texada Group. The limestones are characterized by massive or thick beds of microcrystalline carbonate. Generally very calcic with less than one percent MgO, however, towards the north end of the island limestone quarrying by Ash Grove Cement in the Blubber Bay Quarry indicates a zone up to several hundred feet thick of high MgO limestones (pers. com. R. Grainger). In parts the limestone shows fine laminations, presumably shale or siltstone. Quatsino rocks are generally flat lying or gently dipping to the northeast on the western side of Texada Island by the Blubber Bay quarry; to the east of the quarry the limestones show intense folding possibly related to movement along fault zones. Some rotation of bedding due to faulting is also probable. Proximal to intrusions and dykes the limestone becomes weak to strongly bleached and recrystallized. This bleaching and recrystallization is a key indicator of metasomatic alteration and associated with skarn formation within the limestone.

The Island Intrusive suite is exposed at various localities throughout the island. Rocks are typically granodiorite to diorite in composition, however intrusives at the Texada Iron Mines are classed as quartz monzonite by Sangster (1969). The intrusion along the east coast of Texada by the Little Billie Mine has been classed as a granodiorite; intrusions by the Paris and Loyal mines are hornblende quartz diorites. Dykes of andesitic to dacitic composition are commonly found throughout the limestone unit. They occupy two distinct orientations; the first at an azimuth of 340 to 350 degrees, and the second at 270 degrees. The later dykes offset the former and show less alteration. A quartz-feldspar porphyry dyke crosscut the north end of the island in the Paris area at an azimuth of 340 degrees. Contact relationships indicate that it is older than the more basic dykes, but is offset by the northerly trending faults. This dyke may be Tertiary (?) in age.

The most significant form of mineralization on the island is skarn developed in the limestones and volcanics adjacent to dykes and plugs of the Island Intrusives. The skarns can be classified into two distinct types based on mineralogy and economic commodities. Iron skarns (Texada Iron Mines) were major producers of magnetite, some copper and lesser gold. Copper skarns near Van Anda produced appreciable amounts of copper and gold. The Marble Bay Mine, a prime example of this skarn class produced over 50,000 ounces of gold from 314,000 tons of ore during the early 1900's. Gangue mineralogy in both cases consists of prograde garnet-pyroxene and retrograde amphibole-epidote with wollastonite noted in some copper skarns.

Shear hosted quartz veins with varying amounts of gold, silver, pyrite, arsenopyrite, sphalerite, galena, chalcopyrite and pyrrhotite are common within the volcanics at Surprise Mountain. Table 1 lists the recorded producers from the island. Vein deposits tend to be small, but high grade gold producers, or copper rich with little associated gold.

TABLE 1

MINE	Years of Production	Tons Produced	Au Ounces Produced	Calculated Grade Gold oz/t	Silver oz/t	Copper %	Fe Conc. tons	Deposit Type
Texada Iron	1957-1976	18,800,900					10 M	Magnetite skarn
		2,861,400	28,531	0.01				
Marble Bay	1899-1929	314,192	50,001	0.16	1.29	2.4		Copper-gold skarn
Little Billie	1896-1916	6,296	1,610	0.26	1.13	2.1		Copper-gold skarn
	1948-1952	63,934	10,066	0.16	0.49	1.2		
Cornell	1897-1919	44,849	15,146	0.34	1.57	3.4		Copper-gold skarn
Copper Queen	1903-1919	827	318	0.38	2.93	4.3		Copper-gold skarn
Loyal	1917-1918	59	11	0.19	2.63	8.7		Copper-gold skarn
Retriever	1916-1917	368	9	0.02	0.80	3.4		Shear/vein deposit
Marjorie	pre-1916	217	23	0.11	0.41	0.8		Shear/vein deposit
Gem	1914	2	146	73.00	4.00			Shear/vein deposit
		Total	105,861					

7. EXPLORATION PROGRAM

7.1 General

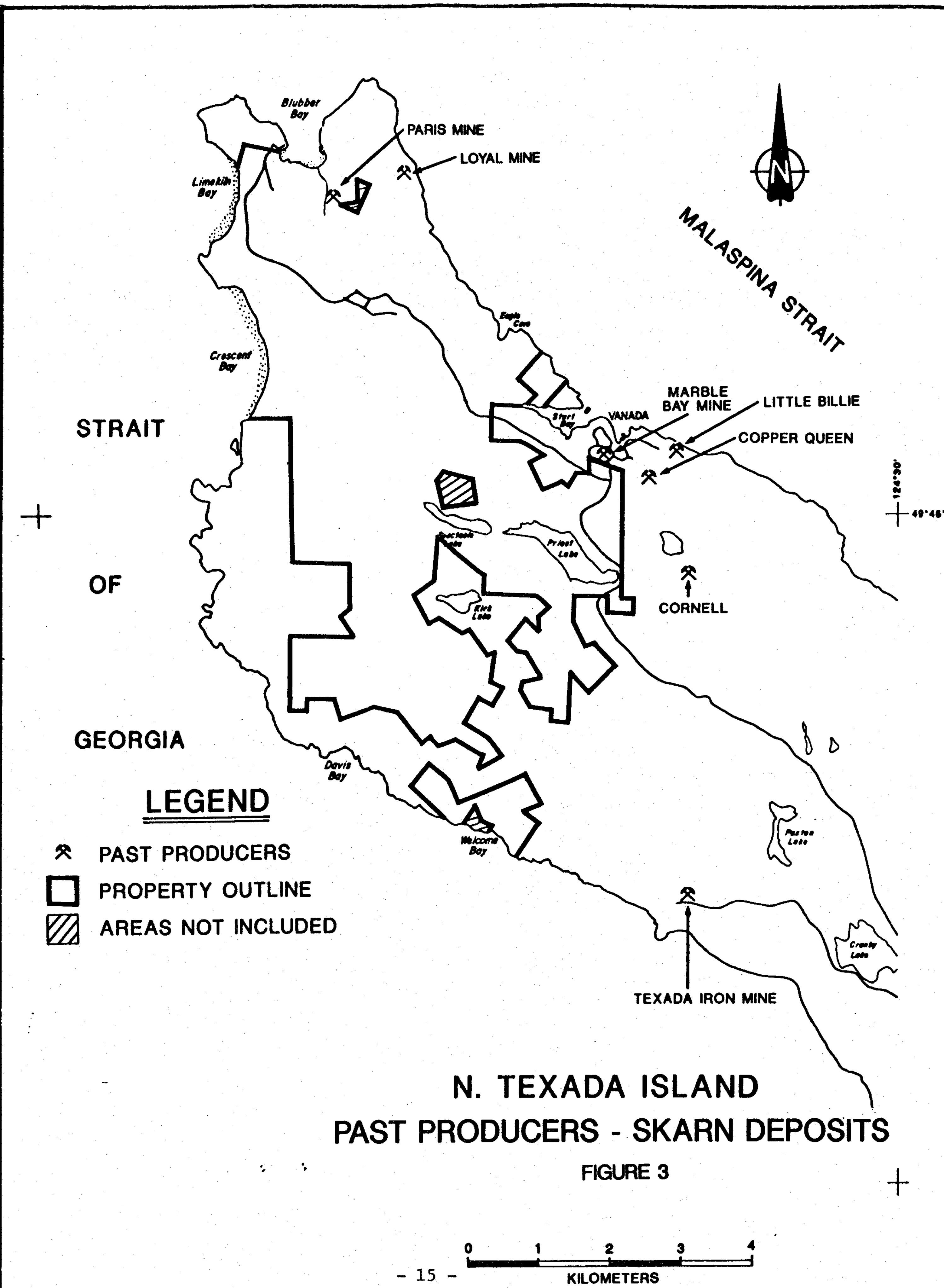
The exploration program was divided into two areas of interest. The primary target was copper-gold skarns similar to the Marble Bay Mine, but with tonnage projections in the two to three million tonne range grading 8 grams gold per tonne or better. Skarns of significant size are known to develop at the volcanic/limestone contact such as those at Texada Iron Mines.

The second target was shear hosted polymetallic quartz veins with gold mineralization found within the Karmutsen volcanics. The main area of interest, Surprise Mountain, has had a considerable amount of work (much of it undocumented) done on it over the years. A deposit of one million tonnes grading 15 grams gold per tonne would be required.

Much of the program involved the compilation of data from various sources in order to develop an overview of the property and assess previous gold exploration. Locating and sampling many of the old showings and re-establishing old grids occupied much of the exploration activities. Much of the compilation work is still in progress at this time and the following descriptions are preliminary observations and findings.

7.2 Exploration Model - Gold Skarn Deposits

The basic exploration model for skarn deposits is based on observations of both the Texada Iron Mine and the copper-gold skarns around Van Anda (Map 1, Fig. 3).



N. TEXADA ISLAND
PAST PRODUCERS - SKARN DEPOSITS
FIGURE 3

The copper-gold skarns historically tend to be moderate grade, low tonnage deposits. They are found within the limestone unit, associated with intrusive bodies and show a strong vertical structural control made evident by examination of the old plan and cross-section maps from the mines. Economic portions of the skarn are restricted within the larger vertical zones of silicate skarn development. The Marble Bay Mine has a vertical extent of approximately 1700 feet, and produced 50,001 ounces of gold from 314,000 tons of ore.

The skarn development is best seen at the Texada Iron Mines where significant tonnage (20 million tons) was developed along the flat lying contact between the volcanics and limestones proximal to the intrusive contact. At the Prescott Pit, vertical shoots of skarn mineralization can be seen extending upwards from the main ore body for greater than 250 meters.

Cross-sections of the Marble Bay Mine indicate that the skarn zone flattened out at depth, presumably as it neared the volcanic/limestone contact. No recorded geological information supports this hypothesis at the Marble Bay Mine, but the potential of a large tonnage deposit along the contact can be visualized. If the same chemical and structural parameters that govern the deposition of gold in copper-gold skarns within the limestone exist at the volcanics/limestone contact, then the potential for large tonnage high grade skarn zones is greatly enhanced.

It is important that we identify surface expression of gold rich skarn mineralization regardless of size, as a guide to deeper large tonnage deposits.

Two distinct areas, the M-21/Cadet area near the town of Vananda, and the Paris Mine area at the north end of the island became prominent from early compilation work. Much of the exploration program therefore focused on these areas.

7.2.1 M-21/Cadet Grid Area

The M-21/Cadet area is centered on a hornblende porphyritic diorite (4a) plug locally called the M-21 intrusive (Map 1, 2). Airborne magnetic data [Boniwell (1988)] suggests that the plug is associated with a larger intrusive centered approximately one kilometer south of the town of Van Anda. The M-21 intrusive trends roughly 340-350 degrees suggesting emplacement along an early structural break. Numerous old workings can be found along the contact between the intrusive and the Quatsino limestone, often occurring within embayments in the intrusive. Magnetite-garnet-pyroxene skarns containing chalcopyrite with lesser amounts of pyrite, pyrrhotite, epidote, and amphibole, characterize the skarn development. Gold is also associated with these skarns with values up to 0.66 ounces per ton reported from previous workers (Dasler 1986).

In order to properly map and locate the various showings, 21 line kilometers of the old M-21 grid were re-established. This proved to be a time consuming job and revealed that the grid lines do not at times even closely approach their orthogonal projections as indicated on previous maps. Some questions exist as to the actual location of map features. No indication is made as to whether mapped geology is based on the true grid projections or an idealized grid projection. A new grid is recommended over this area to eliminate any ambiguities.

The Volunteer Road Show (Map 2), which now lies on the Freeport-Van Anda Gold joint venture ground was drilled in 1986 by Rhyolite Resources (Dasler 1986). Four shallow holes tested surface magnetite-garnet skarn which ran up o 0.34 ounces gold per ton. Drill results were discouraging with the highest value being 160 ppb gold over 0.61 meters.

Four old samples from the Volunteer Magnetite-Copper Shaft (Map 2) gave a range of values from 0.45 to 0.66 ounces gold per ton (15.45 to 22.6 grams gold per tonne). Resampling of the skarn by Echo Bay returned values of 1.47 (XR31436) and 9.74 (XR31435) grams gold per tonne. Just 115 meters southeast, resampling of magnetite-garnet skarn in an old pit resulted in an 8.88 gram per tonne gold sample (XR31438).

The Cadet Show (Map 2) is a small plug of hornblende diorite just off the southern edge of the M-21 Intrusive with a well developed envelope of pyroxene-garnet skarn enclosing a magnetite-garnet core in contact with the intrusive. In 1985 Searchlight Resources (Dasler 1986) drilled five short holes into this skarn to test surface values which ranged from 0.004 to 0.52 ounces gold per ton (0.14 to 17.8 grams gold per tonne). Drill results were poor with a high of 450 ppb gold over 0.43 meters the best result. Resampling of the skarn by Echo Bay resulted in values of 1.58 grams gold per tonne from a magnetite-garnet skarn (XR32573) and 8.64 grams gold per tonne from a pyroxene-garnet-chalcopyrite skarn (XR32572). The skarn is not extensive, but warrants further trenching to determine the actual distribution of skarn development.

Further east from Cadet, and along the contact between the volcanics and limestones is a zone called the Glady's C Showing (Map 2, 3). A magnetite-garnet-pyroxene skarn ±chalcopyrite ±pyrite is exposed in four old pits and trenches. Previous sampling generated a high value of 2.42 grams gold per tonne from the magnetite skarn(?). Resampling resulted in a 6.31 grams gold per tonne sample from a garnet-pyroxene-chalcopyrite skarn. The magnetite-garnet skarns were anomalous in gold, but did not assay greater than 1.0 gram per tonne gold.

The main area of interest to previous workers (Wares 1984) in this area was the M-21 zone itself (Map 2). The zone is identified by an area of white recrystallized limestone cut by numerous, variably altered dykes mineralized with pyrrhotite and pyrite. Only weak skarn development is seen in the limestone and is expressed as a magnetite-pyrrhotite zone. Sampling of the various showings revealed anomalous results. The highest value, 4.26 grams gold per tonne over 0.7 meters came from the magnetite-pyrrhotite skarn. Geophysics (SP) defined a northwest trending anomaly proximal to a coincident gold, silver, zinc soil geochemical anomaly. These results prompted a 21 hole shallow drill program over the length of the SP anomaly. Assay results from the drilling were poor with virtually all samples assaying less than 0.01 ounces gold per ton. Hole MS-83-3 cut an altered andesite dyke mineralized with pyrite and chalcopyrite which ran 0.348 ounces per ton over 0.5 meters. A second notable result from hole MS-83-13 came from a zone of quartz veins cutting an altered andesite dyke with pyrite and pyrrhotite mineralization. This sample ran 0.21 ounces gold per ton over 0.5 meters (7.2 grams per tonne). Surface sampling in this area by Echo Bay ran up to 49.85 grams gold per tonne from a grab sample taken from a pit sunk on the dyke. Surface results are spectacular, but there is only limited extent and thus potential to the zone.

Most of the work in this area has centered on shallow drilling of small, but anomalous skarn zones. The poor results in the drilling may not be so discouraging if a broader view is taken of the exploration target. The M21 intrusive is associated with numerous gold rich skarn zones. Future work should focus on detailed mapping of these zones and geophysics to determine the potential for a large tonnage skarn zone at depth.

7.2.2 Yew Grid

The Yew Grid area lies to the east and overlaps the M-21 Grid in the area of the Glady's C Showing (Maps 2, 3). Ten man days were spent mapping the grid area towards the end of the exploration program.

The area is dominated by Karmutsen Formation volcanics typically fine grained and/or feldspar phyric basalts and amygdular basalts. Intercalated within the volcanics at the Yew Showing is an intravolcanic limestone bed (2a). This unit is 0.5 to 2 meters thick and has been partially and/or wholly replaced by massive pyrite ±chalcopyrite ±pyrrhotite ±magnetite. Rhyolite Resources in conjunction with Polestar Resources Inc completed a program of backhoe trenching and air track drilling in an attempt to define a tonnage and grade for the deposit. The grade was reported to range from 0.01 to 0.6 ounces gold per ton. The drilling indicates that the limestone unit is flat lying in this area, but complicated by faulting. This work failed to define an economically viable deposit and no further work was planned by Polestar.

Fine to medium grained hornblende diorite plugs intrude host volcanics and limestones. Towards the north end of the grid the volcanic/limestone contact is not well exposed but jointing in the limestone and a weak shear fabric in the volcanics suggest that it is fault related. Sharp contrast between the the total field magnetics expression in the limestone verses the volcanics also supports a fault contact. Sampling failed to reveal any new significant showings apart from the previously mentioned Glady's C and Yew showings.

7.2.3 Paris Mine Area

The Paris Mine area is located at the most northeastern end of Texada Island near the town of Blubber Bay (Map 1, 4). Work at the Paris Mine itself is believed to have been done around the turn of the century and is poorly documented. Three old shafts have been located; an adit reportedly leads to one of the shafts. Eleven ounces of gold were reportedly mined from the Loyal Mine from 1917 to 1919. The Loyal Mine is located near the coast to the east of the Paris Mine.

The Paris Mine area is underlain by grey to white bleached, medium to coarse grained recrystallized limestone (3b). Medium to coarse grained quartz diorite stocks intrude the limestone and are likely the cause of the bleaching. Medium to coarse hornblende phenocrysts are common in the larger stocks and dykes, but are not always present. Fine to medium grained andesite dykes from 1 to 10 meters in width intrude the limestone along a dominant north-northwest trend. Faulting in the area also appears to follow this same trend; presumably the dykes intruded along these structurally prepared zones. A late event (Tertiary(?) -4f) quartz-eye porphyry dyke can be traced across the map area at an azimuth of 285 degrees and shows crosscutting relationships with the other intrusive units. The contact between the hornblende diorite and quartz-eye porphyry is exposed in the open cut of the Paris adit. The contact dips steeply to the south and the diorite is sheared and altered. The stocks and larger dykes show moderate to strong epidote alteration in the form of patches and veinlets.

Skarn mineralization is associated with a northeast trending contact between a hornblende diorite stock(?) and a limestone unit (Map 4). A magnetite-garnet-pyroxene skarn is developed at the Paris #2 and #3 shafts along the diorite. Approximately 200 meters to the northeast, at shaft #1, massive sphalerite-pyrrhotite-chalcopyrite skarn is developed. Just southeast of shaft #1 a series of trenches exposing a pyroxene skarn with pyrrhotite is exposed. Mapping infers that the skarn zones are developed along the same intrusive contact. Thirty element ICP analysis indicate only low gold values in this zone. The best result was from sample XR32574 which carried 385 ppb gold and 36.5 ppm silver. Of note, was a highly anomalous bismuth value of 82 ppm. Midway between shaft #1 and #2 a sample (XR32046) of recrystallized limestone with massive pyrrhotite and chalcopyrite ran 620 ppb gold and 18 ppm bismuth. A second sample (XR31981) of actinolite-chalcopyrite-sphalerite skarn associated with a large northwest trending dyke and the hornblende diorite stock assayed 2.88 grams gold per tonne, 46.0 ppm silver and 54 ppm bismuth. Just northeast of shaft #2 a sample (XR31979) of magnetite-garnet skarn, from an old dump pile ran 2.37 grams gold per tonne with 31.3 ppm silver and low (4 ppm) bismuth. An old trench between shafts #2 and #3 was cleared and a well developed garnet-pyroxene-chalcopyrite skarn was exposed. A sample (XR31986) of garnet-actinolite skarn with minor chalcopyrite ran 13.96 grams gold per tonne, 13.2 ppm silver and 2280 ppm bismuth. A second sample (XR31856) of magnetite-garnet ±chalcopyrite skarn ran 12.86 gram per tonne gold from the same trench; bismuth was only 6 ppm and silver 22.8 ppm. The skarn is approximately 4 meters in width and is cut by several small hornblende porphyry dykes. More trenching and sampling is required to fully evaluate this skarn zone.

Trace element associations can be quite variable in gold skarn deposits. These elements include: Ag, Te, Bi, Cu, Zn, Pb, As, Co, Sc, Ga, Pb, Sn, W and Pt. Ray (1989) suggests that the presence of Pb, Ni and particularly Bi are characteristic of end member gold skarns. At the Paris Mine bismuth values associated with gold values are highly anomalous, other elements do not show as distinct a correlation.

Previous workers (Wares 1983) suggest that re-assays of drill core (data not available) showed that gold values are low and erratic and are not of economic interest. Preliminary work by Echo Bay indicates highly anomalous gold values are attainable and further work is necessary to fully evaluate the area. Relogging of the drill core would be useful in defining skarn zonation at the Paris Mine area.

7.2.4 Canada Trench

The Canada Trench is located 800 meters east of the Paris Mine and 800 meters south from the Loyal Mine (Map 1). Again, documentation is poor. The trench probably dates from the early 1900's; circa 1916 reports of the B. C. Ministry of Mines acknowledges the area but states that no work was done on the claims during that year. The trench has a northwesterly strike (350 degrees), is approximately 300 meters in length and is up to 5 meters deep. A hornblende porphyritic diorite dyke along the margin of the trench is up to 3 meters in width. Bleaching and recrystallization of the limestone proximal to the dyke is observed. Mineralization is confined to the contact zone of the dyke and limestone and rarely exceeds 1 meter in width. Gold values of 4.48, 10.02 and 15.94 grams per tonne from samples XR31861, XR31862 and XR31993 respectively is associated with massive magnetite-pyrite-chalcopyrite skarn. Only sample XR31862 had anomalous bismuth value at 46 ppm.

7.3 Surprise Mountain

7.3.1 General

The southwestern portion of the property is underlain by Karmutsen Formation volcanics. This area has been informally called the Surprise Mountain area for identification.

Several 1:5000 scale mapping traverses using orthophoto base maps for control were run in August, 1988. The objective was to locate and evaluate old showings, plus any new occurrences, for gold potential.

The geology (Map 5) of the area comprises a series of northwest trending, interbedded massive, and pillowed flows and tuff units intruded by coeval(?) mafic dykes and sills. Basaltic flows constitute the largest member by volume and exhibit a great textural variation including feldspar phyric (1a), chlorite-epidote-calcite amygdular (1b), fine grained massive (1c) varieties and a columnar jointed (1f) unit which may be a more recent volcanic event. No mention is made of this columnar jointed flow type in either McConnel's (1914) work on Texada Island or Muller's (1969) work on Vancouver Island. Pillowed basalt (1d) horizons vary in thickness from 20 to 300 meters, becoming thicker to the northwest. Individual pillows are weakly deformed and range in size from

0.5 to 1.5 meters in diameter. Intercalated basaltic tuffs and agglomerates (1e) occur throughout the stratigraphic section. They often form discontinuous horizons and range from 10 to 100 meters in thickness. Minor outcropping of weakly deformed mafic subvolcanic intrusives (1g) occur sub-parallel to the volcanic stratigraphy. The largest of these sills (?) occurs just south of Surprise Mountain. It can be traced along strike for approximately 1000 meters and has a thickness of 50 to 100 meters.

Mineralization is within quartz and quartz-carbonate veins with variable sulphide content associated with narrow shear zones. The vein/shear systems are typically steeply dipping to vertical with widths up to several meters, but usually less than 1 meter. Two major trends of faulting are recognized; one set trending at 300 to 340 degrees and the second set at 050 to 065 degrees. Many other less prominent fault directions were observed. The veins, tending to occupy topographic lows, are best observed along the western shoreline of the island where outcrop exposure is excellent. Sulphide mineralization consists of pyrite, chalcopyrite, galena and sphalerite ±arsenopyrite. In some cases chalcopyrite appears to be associated with a late mineralizing event, occurring within late stage quartz-carbonate veins, often brecciated, that crosscut earlier quartz veins. Alteration related to mineralization is typically confined to within the shear/vein structure itself with only limited discernible effects on the surrounding wallrock. Prominent alteration types are silicification and sulphidation. Although narrow in lateral extent the alteration imparts a localized non-magnetic character to the magnetic volcanics. This may be useful in defining zone of mineral potential from both airborne and ground magnetics surveys. Numerous showings located during mapping are shown on Map 5. The most promising area, one which has received much attention in the past, is the Silver Tip-Nancy Bell zone on Surprise Mountain. The area has been mapped at a scale of 1:1000 (no reference) using a 30 meter line spaced grid for control.

7.3.2 Silver Tip - Nancy Bell Zone

The Silver Tip shear zone strikes at 315 degrees and dips 75 to 80 degrees to the northeast and can be traced for a strike length of 250 meters. The zone appears to be cut off to the northwest by faulting, but may continue or coalesce with other structures to the east. Two old shafts (Silver Tip #1 and Silver Tip #2) are located 70 meters apart along the shear. The shear and mineralization are typically less than 1 meter in width but sulphide rich zones carry values in the 10 gram gold per tonne range. Mineralization comprises massive pyrite, chalcopyrite with lesser sphalerite and galena within quartz and quartz/carbonate veins. The veins at time exhibit druzy texture indicating open space mineralization. A 0.6 meter chip across the Silver Tip shear returned a gold value of 12.21 grams per tonne. A sample (XR32622) of carbonate vein and altered volcanic with no appreciable sulphides from the Silver Tip dump ran 13.99 grams per tonne gold. This material is common within the dump, but no exposures were noted during mapping and sampling of the area. The Silver Tip #1 shaft is reported to be approximately 340 feet deep (Report of the Minister of Mines 1897, 1898) and it would be of great interest to access the now flooded workings. In 1986 Rhyolite Resources drilled nine short holes (Rhyolite Resources company files) to test the shear zone. The holes were collared very close to the shear, and were not a good test of the depth extent. The best intersection was 0.506 ounces gold per ton over 0.35 meters.

The Nancy Bell shaft (located on the Nancy Bell shear) is 240 meters northeast of the Silver Tip workings. The shear zone strikes at 145 degrees and dips at 65 degrees to the southwest. Mineralization is similar to the Silver Tip zone, but the shear is up to 2-3 meters in width in places. En echelon bodies of silicified and mineralized volcanics indicate a component of right lateral shearing. A grab sample (XR32623) with 15 percent chalcopyrite and pyrite ran 13.38 grams per tonne gold. Chip sampling (XR32608) across the shear, which is strongly chloritized but has no evident veining, ran 0.82 grams per tonne gold over 0.5 meters. A continuation of the sample line (XR32607) through the silicified and sulphide rich portion of the shear ran 6.0 grams per tonne gold over 0.6 meters. A composite grab sample of sulphide rich material (XR31756) ran 16.48 grams per tonne gold. All mineralization occurs on the footwall side of the vein; sampling suggests that high sulphide content is essential for economic grade gold values. Neither the Silver Tip or Nancy Bell zones themselves may be of economic interest, but their intersection may have the potential of developing significant tonnage at the 10 to 12 grams per tonne gold range.

Further northwest, the Thyee Showing (Map 5) is the locus of a series of trenches cutting, with an adit driven 15 meters along, another shear structure. The shear strikes 090 degrees and dips at 65 degrees to the south, and is mineralized with massive pyrite and chalcopyrite plus malachite staining. Chip sampling of the shear returned values of 9.19 grams per tonne over 0.35 meters from within the adit. Sampling on surface returned 5.04 grams per tonne gold. Linear surface trends suggest the dominant fault direction is northwest-southeast, but mineralization is developed along conjugate zones. This situation differs from those at the Silver Tip and Nancy Bell zones where mineralization occurs parallel the main shear direction. The veining at the Thyee showing exhibits much more of a brecciated texture, with multiple phases of druzy quartz, than exists at the Lion showing which appears to sit on the same structure. Grab samples from the Lion showing containing minor pyrite ranged from 1.41 to 3.16 grams per tonne gold. A high grade grab (XR32593) of the quartz vein with 20 percent pyrite and lesser chalcopyrite ran 64.9 grams per tonne gold.

7.3.3 Other Showings

Many other showings at various development stages were located on the property (Map 5). Most of the prospects (Surprise Shaft, Copper King, Retriever, Silver King) were mined for their copper content, as gold and silver values are low. The Retriever is located along the intersection of a northerly and a (later?) easterly set of faults. Quartz vein hosted sulphides consists of pyrite, chalcopyrite, galena and sphalerite. The highest gold value from these veins was 112 ppb gold, but silver ran as high as 37 ppm. The Ram (Apacha?) showing appears similar to the Retriever but no gold values over 10 ppb were obtained, with silver equally as poor. The Silver King (Plume?) has similar mineralization associated with shears at, 315 degrees dipping 85 degrees to the northeast, and 115 degrees dipping 80 degrees to the south. No samples were anomalous in gold or silver. Just south of the Surprise Shaft are located a series of old pits along a shear zone striking 155 degrees and dipping 70 degrees southwest. Sampling of the druzy quartz veins with pyrite and chalcopyrite returned values of (XR32640) 1.17 grams per tonne gold and 105.8 ppm silver. Other samples in these pits ranged from 102 to 265 ppb gold and up to 54.3 ppm silver.

Sample XR31767 of a quartz-carbonate vein breccia with 2 percent pyrite, 1-2 percent chalcopyrite and less than 1 percent galena from the old Gem Mine ran 5.45 grams per tonne gold. This old mine is reported (local prospectors) to have been very high grade. Government reports (BCDM Mines Index No. 3, pg 196) indicate that only 2 tons of ore were mined in 1914 and 146 ounces of gold were produced. The workings at the mine site suggest that considerably more mining took place. Recent research by local workers uncovered a set of level plans to the Gem Mine. The plans show two or three headings on three different levels, with considerable exploratory drifting.

Sampling of a shear zone at the Golden Rod zone resulted in a value of 6.28 grams per tonne gold from a strongly sheared quartz-carbonate vein with disseminated medium to coarse grained pyrite. This shear strikes 015 degrees and is subvertical in dip with horizontal slickensides. Results from other samples were poor, the next best returning 312 ppb gold.

The X-ray Zone, located within the confines of the Surprise Mountain grid, is a quartz stockwork within a feldspar phyric basalt unit (1c). A thick sequence of mafic agglomerate overlies the basalts to the north. Massive to disseminated, sub to euhedral pyrite is mineralized within a quartz stockwork zone which trends northwest for some 100 meters. The most significant value sampled was 242 ppb gold. Silver values were disappointing. A similar zone of quartz stockwork is reported (pers. com. D. Murphy) further to the southeast onto some adjoining claims.

The whole of the Surprise Mountain area is an interesting area of potential gold mineralization. Strong, but narrow shear zones with moderate to strong gold values can be traced for some distance along the surface. Many of the faults exhibit a very brittle, brecciated characteristic typical of high level structures. The mineralization may be Tertiary (pers. com. P Erdmer) in age, exploiting pre-tertiary structural zones.

8. GEOPHYSICS

8.1 General

Previous ground geophysics data from the earlier programs on Texada Island was reviewed by Pacific Geophysical for Echo Bay to determine the validity of the data. A brief review is given in Appendix B regarding findings. Much of the geophysical data on the maps is valid, though some of the IP techniques may be somewhat suspect. The interpretive maps are more suspect in that several workers have combined various interpretation to make final compilation maps. It was noted that in some cases erroneous anomalous zones were defined and transferred to the compilation maps. Of all the data the magnetics data is the most valid and therefore useful. Echo Bay has recontoured the field data using an inhouse CPS/PC software program by Radian Corporation. The results of the contouring are similar to the original interpretation but the maps are now in a more workable format. A 21 kilometer total field magnetics survey was carried out over the M21/Cadet grid area.

An airborne vlf, em and magnetics survey was commissioned as a joint venture between Echo Bay, Freeport McMoRan and BP Resources of Canada to fly the northern end of Texada Island. Approximately 750 line kilometers were flown during the summer of which Echo Bay's ground constituted 47 percent. The survey was flown by Aerodat Ltd. Interpretation and reporting was contracted to Excaliber International Consultants Ltd. All geophysical data contained within this report has been checked and any spurious data is indicated on the maps.

8.2 Airborne Geophysics

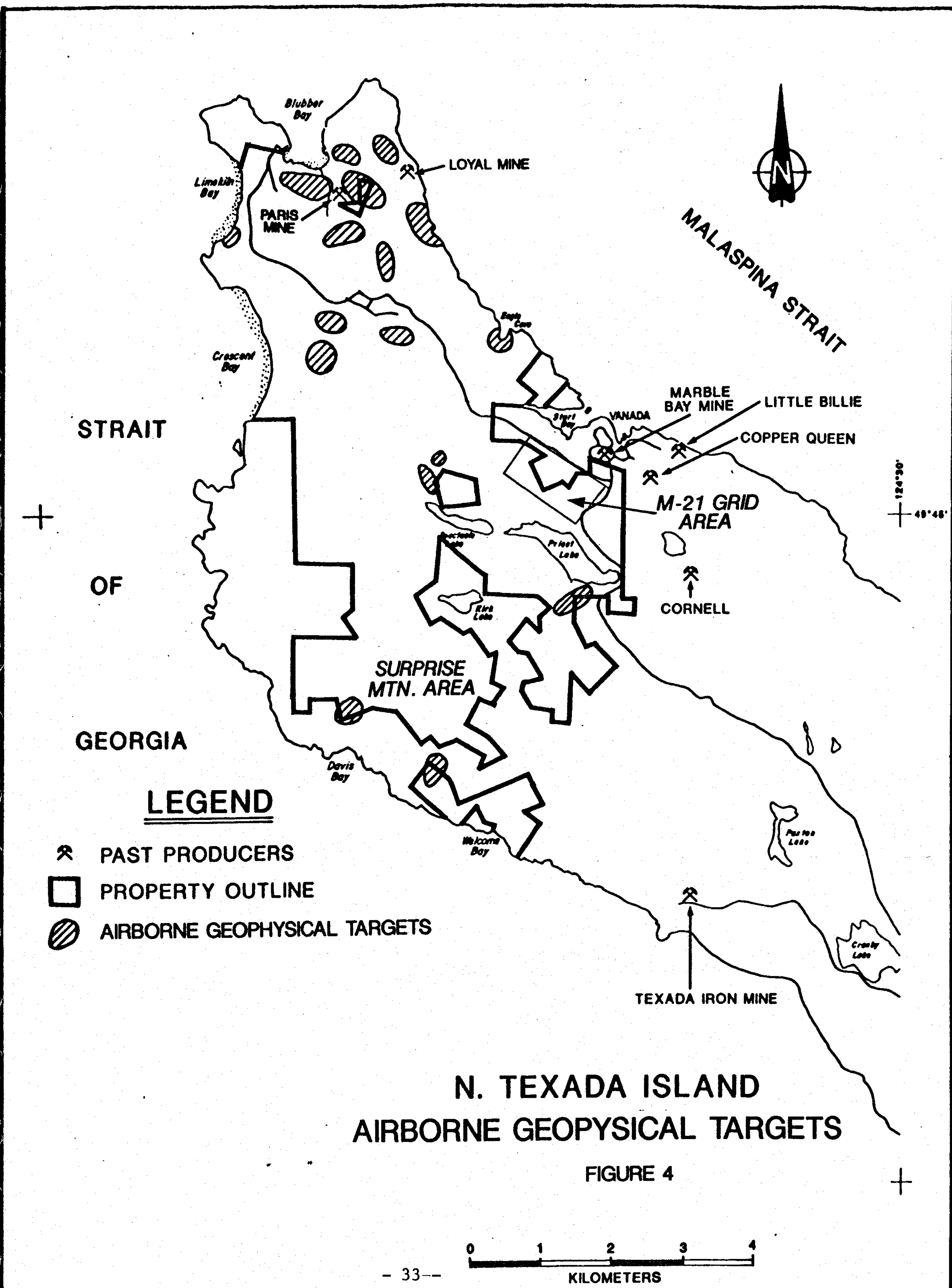
For the purpose of this report, selected highlights of the geophysical report (Boniwell 1988) will be discussed. The reader is directed to the report if more detail is required. A strong magnetics contrast exists between the Quatsino limestone and the Karmutsen volcanics. The volcanics and Island Intrusives show a markedly high magnetic relief (up to 3000 nT) whereas the limestones give a generally flat, low relief signal unless intruded by dykes or mineralized by skarn. This sharp contrast favors the interpretation of contacts between the volcanics and limestone which for the most part are fault contacts. The magnetic data indicates that the contacts of the intrusive bodies are generally steep. The exception may be the interpreted intrusive body at the north end of the island by the Paris and Loyal mine areas. The map feature here may represent a south plunging intrusive of which the intrusions along the coast may be surface expressions. The magnetics also indicates that there is considerably more buried intrusion than previously was believed on the island, outlining more potential for skarn development. Strong northwest trending faults such as the Marble Bay and Limestone Bay faults are also clearly evident on the magnetics map. Most of the magnetic lows in the volcanic package are likely fault structures as ground work indicates that fault and shear zones show a distinct depletion in magnetic component through alteration. This is significant in that major structural zones with low magnetics expression may indicate that considerable fluid flow - wall rock interaction, which altered the volcanics by way of magnetite depletion, may also have deposited significant amounts of gold.

The results of the vlf were not nearly as effective; Boniwell (1988 page 11) suggests that the data is topographically dependant and is being preferentially channeled through the active weathering layer. Culture was also a problem; power lines and radio transmission towers were the most pronounced response.

The em data in its present format shows little favorable information. It has been suggested (P. Cartwright) that more useful information may be produced from the in-phase and out-of-phase profiles.

On the basis of the foregoing information, the assumption that gold skarns are typically found on the flanks of intrusive rocks, and that skarns may have a component of magnetite and/or pyrrhotite, numerous targets areas have been suggested. Structural control was also considered when selecting these areas. It should be noted that not all gold skarns need be magnetic in character, or that magnetite skarns be anomalous in gold, thus, caution must be used when evaluating these target areas and other areas of interest.

Boniwell (1988) has outlined 17 zones of interest within the Echo Bay - Rhyolite grounds. These localities are described by Boniwell and are not included in this report, however the areas are outlined on Figure 4. Twelve of the targets are within the Quatsino limestone, four of these are clustered around the Paris and Loyal mines area. Three more are located south of the highway and west of the old Domtar Quarry, centered on what is proposed to be a buried intrusive. Another is located over Eagle Cove where local prospectors report copper and skarn mineralization. A further 4 targets lie within the volcanics and most likely do not represent skarn type targets. Excaliber Consultants recommend that a program of self potential and induced



N. TEXADA ISLAND AIRBORNE GEOPYSICAL TARGETS

FIGURE 4

polarization/resistivity be undertaken in conjunction with mapping, to further evaluate the target areas.

8.3 Ground Magnetometer Survey - M21/Cadet Grid

A total field magnetics survey was undertaken on the M21/Cadet grid re-established by Echo Bay personal. An EDA Omni IV base and field magnetic system were used during the survey. Readings were taken every 25 feet or 12.5 feet when warranted along survey lines 100 feet apart. Data was processed by in house contouring system and final contour and postings maps were produced at 1:1000 scale. It should be noted that the grid, as re-established by Echo Bay, is not as that defined on previous geology and geophysical maps. There are many irregularities which to the authors' knowledge were never recorded. Problems may exist in correlating between the geophysical data and the previous grid geology. The current geophysical maps have been plotted assuming an orthogonal grid, but it is suggested that the data be converted to its true position for future reference. The contour and postings maps (Maps 7a, b, c and Maps 8a, b, c) can be found in the back pocket of the report.

Results of the survey clearly show the M21 intrusive and the Cadet plug as high relief, strong magnetic features. The effects of post intrusive faulting defined as magnetic lows is evident. The contact zone between the volcanics and the limestones is clearly defined in the vicinity of the Glady's C showing. The sharp contrast between the limestones and volcanics indicate that the units are in fault contact. Skarn zones such as the Cadet Show, Glady's C and others show up as distinct highs (up to 1500 nT). The M21 zone is not as pronounced as other skarn zones, as might be expected since pyrrhotite is more prevalent than magnetite, and the skarn is not as well developed.

9. CONCLUSIONS

The results of both the airborne geophysical program and the surface exploration program were successful in outlining prospective areas of gold potential. Four airborne target areas encircle the Paris/Loyal mines area. Mapping and sampling of this area has defined skarn zones anomalous in gold. Preliminary indications at the Paris Mine suggest a strong association of gold with garnet-pyroxene skarn and chalcopyrite ±bornite mineralization. The remaining airborne target areas lie within the Quatsino Limestone and are at various stages of exploration development. All these areas must be considered when evaluating the potential for economic gold mineralization.

Highly anomalous gold values from skarn zones associated with the M21 intrusive indicates the potential of this area. The known skarns zones (Cadet, Glady's C etc.) have limited surficial extent and have yet to be explored to depth. No airborne target was defined for this area, but this area should not be excluded on this basis alone.

The best potential for economic gold values lies with the garnet-pyroxene skarn zone which are mineralized with chalcopyrite-bornite ±pyrrhotite and are commonly associated with zones of massive magnetite. It is therefore essential to map in detail and document the relationship of the various skarn assemblages and alteration zones of the limestone unit. Economic mineralization within the Marble Bay mine was known to exist within broad zones of garnet-diopside gangue (Newton 1916).

The Surprise Mountain area within Karmutsen volcanics also produced some significant zones of gold mineralization. Gold values are associated with north to northwest trending quartz/carbonate shear zones, or related faults, and are mineralized with pyrite-chalcopyrite ±galena ±sphalerite ±pyrrhotite. These zones tend to be less than a meter in width but grade up to 0.7 opt gold. The depth potential of these zones is unknown, but may be significant. The Nancy Bell/Silver Tip zone appears to have the best potential if the shear zones do intersect at depth. Diamond drilling would establish this relationship.

The variation of mineralization from base metal rich zones weak in gold and silver, to gold rich zones implies an epithermal or mesothermal system exists in the Surprise Mountain area. More detailed sampling and mapping is required to fully evaluate this area.

10. RECOMMENDATIONS

To fully evaluate the property for gold skarn mineralization a comprehensive exploration program should be carried out with specific attention being paid to gold occurrences and air borne target areas. It is recommended that the following activities be undertaken:

* property scale mapping (1:5000 or 1:2500) of the joint venture grounds focusing on skarn assemblages and distribution, alteration patterns of the limestone, structural controls on skarn zones, and association of intrusive units with skarn and limestone alteration.
* control grids covering the north end of the property and where airborne target areas indicate.
* geophysical surveys including induced polarization/resistivity (gradient array with pole-dipole detailing) and ground magnetics.
* soil geochemical survey covering the grid areas. Samples should be subjected to a 30 element ICP analysis. Trace elements patterns of Ag, Bi, Zn, Co, As, Cu, Te, Fe, and W should be closely watched.
* detailed mapping (1:500 or 1:200) of significant skarn occurrences (Cadet, Glady's C, Paris, Loyal and new discoveries).
* trenching and detailed mapping and sampling of skarn showings.
* evaluation of all data and the selection of priority areas for diamond drilling evaluation.

11. REFERENCES

Boniwell, J.B., 1988, Results of a Helicopter-Borne Multisensor Survey, Texada Island, B.C., private company report.

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Dasler, 1986, Assessment Report; Geological, Geochemical and Geophysical Surveys and Drilling on Texada Island. February 9, 1986.

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Muller, J.E. and Carson, D.J.T., 1969, Geology and Mineral Deposits of Alberni Map-Area, British Columbia (92F). GSC Paper 68-50.

Newton, J., 1917, BCDM, Report of the Minister of Mines.

Sangster, D.F., 1969, The Contact Metasomatic Magnetite Deposits of Southwestern British Columbia. GSC Bulletin 172.

Wares, R., 1983, Report on the Bolivar-Cortez-Holly Claim Groups Project during 1983. Rhyolite Resources company files.

12. STATEMENT OF QUALIFICATION

I, Paul Sarjeant of 9101, 119A St, Delta, B.C., certify that:

1) I am a geologist employed by Echo Bay Mines Ltd. Exploration Department, Vancouver, B.C.

2) I have practiced geology for the past 5 years in Canada.

3) I am a graduate of Queen's University, Kingston, Ontario, with a Bachelor of Science (Honors) degree in geology.

Paul T. Sarjeant, B.Sc.
Vancouver, British Columbia

Date: April 18, 1989

APPENDIX A

Project Costs

APPENDIX A

Program Costs North Texada Joint Venture

Wages

P. Sarjeant	Project Geologist			
05/01/-09/10/88	105.5 days @ $175/day		$18,462.50	
G. Haryett	Field Assistant			
06/10/-08/28/88	21 days @ $ 97/day		2,037.00	
J. Cunningham	Field Assistant			
06/10-09/01/88	18.5 days @ $90/day		1,665.00	
M. Wasel	Geologist			
08/05-09/26/88	40.5 days @ $113/day		4,576.50	
S. Stakiw	Geologist			
08/01-09/10/88	26 days @ $111/day		2,886.00	
E. Flood	Geologist			
08/22-09/12/88	8 days @ $132/day		1,056.00	
J. Touw	Geologist			
08/05/-09/10/88	18 days @ $135/day		2,430.00	
S. Howson	Geologist			
08/22-09/03/88	12 days @$135/day		1,620.00	
B. Scott	Geologist			
08/03-10/02/88	21.5 days @ $175/day		3,762.50	
P. Maitland	Cook			
07/25-09/09/88	21 days @ $145/day		3,045.00	
N. Cawthorn	Senior Project Geologist			
	15.5 days @ $260/day		4,030.00	
K. Carter	Director of Exploration			
	4 days @ $340/day		1,360.00	
--	Consultant Geology		1,500.00	
A. McInnis	Draftsperson			
10/02-12/12/88	12 days @ $160/day		1,920.00	
				$50,350.50

Total Travel

Airfares	4,731.34	
Hotels	1,243.52	
Meals	748.72	
		6,723.58

Freight 1,109.55

Groceries 4,543.21

Equipment Rental

Bronco @ $1250/month	3 months	3,750.00	
Bronco @ $1250/month	2 months	2,500.00	
Suburban @ $1550/month	2 months	3,100.00	
Camp @ $500/month	2 months	1,000.00	
			10,350.00

Geophysics		
Airborne Survey	$25,254.00	
Consulting	3,259.00	
		$28,513.00
Fees and Licenses		
Option Payments	12,000.00	
Crown Grant Taxes	186.30	
		12,186.36 X
Drafting and Expediting		913.89
Assaying - 298 ~~soil~~ rx samples @ $13.75		2,860.00
Consumable Materials and Camp Equipment		8,757.87
TOTAL FIELD COSTS		126,307.96
Overhead Allocation		11,266.67
TOTAL COST		$137,574.63
		− 12 186 36
		125388.27

TK

APPENDIX B

Rhyolite Resources -
Texada Island Geophysical Data Evaluation

PACIFIC Geophysical Limited

224-744 WEST HASTINGS STREET, VANCOUVER, B.C. V6C 1A5 TELEPHONE (604) 669-1070

MEMORANDUM

cc. Paul Sarjent

TO: Nigel Cawthorn, Echo Bay Mines Ltd.

FROM: Paul Cartwright, Pacific Geophysical Ltd.

RE: Ryholite Resources - Texada Island Geophysical Data Evaluation

I have studied the geophysical data from the various Ryholite Resources properties on the northern end of Texada Island, B.C., with the objective of providing you with recommendations as to what direction future exploration might take.

It is my understanding that the principal target of interest is skarn type mineralization carrying significant gold values. The secondary target is gold bearing quartz veins, associated with shear zones.

I. SUMMARY

The following is a brief summary of the results from each grid area together with some specific immediate suggestions for further work.

A) Cortez Grid

A very narrow, very high magnitude magnetic anomaly is noted to be associated with the Paris Mine skarn mineralization. No similar magnetic signatures are seen in the area of the Loyal Mine or the Canada Showings; however, interesting high intensity magnetic responses are evident centered at the following locations:

- Line 900S, Station 1600E (trends NNE & SSW)
- Approx. 300 feet west of the main Paris Zone - this mag zone is associated with the only significant VLF-EM zone outlined on the grid.

Other more localized magnetic highs can be seen in the vicinity of the following coordinates:

Line 3300S, Station 75W
Line 2400S, Station 350E
Line 300N, Station 650W

All of the above magnetic anomalies should be investigated in the field to try and ascertain the source of these anomalies.

VLF-EM data does not appear to outline anything of interest, with the exception of the Paris No. 2 Zone mentioned above.

I.P. and Resistivity data are recorded around the Loyal Mine used 300' electrode intervals, which are probably too large to detect anything but an unrealistically large target. Other I.P. work used this same large array and widely spaced lines, which further reduced the survey effectiveness.

A small grid was surveyed using Self-Potential (S.P.) around the Beach Showing (Cortez 4, 16). Two zones of lower than background S.P. are evident and should be checked in the field in addition to the area immediately around the Beach Showing itself.

B) Eagle Grid

There does not appear to be any very high intensity magnetic anomalies present; however, there is a relatively high magnitude response present near the following location:

L 1880N, Station 800E

Field investigation is required in an attempt to ascertain the anomaly source.

C) Irish Grid

A somewhat anomalous magnetic response is noted in SE corner of grid. This feature could be followed up by geological investigation as a first step.

I.P. and Resistivity measurements have been completed using 300 foot dipole lengths and wenner array, which shows a very broad area of high I.P. effect in the SE portion of the Irish Grid. The most probable cause is a rock type having high background I.P. effect; as the large size of the array would only detect very large scale targets.

D) Bolivar Grid

Two distinct NW-SE trending zones of higher than background magnetic values are evident in the data. The more impressive of the two lies SE of the "Discovery Zone", while the other zone is located near the southern boundary of the grid. The southern magnetic zone does appear to be associated with a zone of anomalous I.P. effects and an anomalous VLF-EM zone.

A number of well-defined VLF-EM zones are outlined in addition to the one mentioned above. None of the VLF-EM trends appears to correlate with the "Discovery Zone". The source of some of these VLF-EM conductors may already be known through previous drilling.

Two zones of anomalous I.P. effects are also noted; the so-called "Bolivar East Anomaly" and the "Bolivar South Anomaly". Both features may have been drilled previously. Large dipole lengths (300' & 200') were used to record the I.P. data which reduces the sensitivity of the method to narrower targets.

E) M-21 Grids

A very broad area of considerably higher than background magnetic values is present on the northern part of the survey grid, and this apparently is the surface expression of the prominent air mag anomaly located north of Priest Lake.

Two possibly anomalous I.P. zones are seen in the data recorded over the western end of the M-21 map area. Two hundred foot measurement intervals were used with wenner array.

F) Yew Grid

S.P. survey appears to detect anomalous voltage over all known mineralized occurrences. At least one other S.P. anomaly of unknown source is outlined over the western part of the claim.

Magnetic anomalies only sporadically correlate with the S.P. responses.

G) Nancy Bell - Silver Tip Grid

S.P. surveys outline known mineralization in some locations but not others.

I.P. zones strike through all the known mineralization. In addition, there are at least four interesting S.P. zones of unknown origin which occur coincident with more continuous I.P. zones. All of the I.P. work utilized a relatively short dipole length of 15 meters or less and was, therefore, relatively sensitive to very narrow targets.

Drilling could be considered to test the sources of these coincident I.P. and S.P. zones.

H) Gem - Holly Grids

VLF-EM data is available for the Holly Grid and appears to outline the Holly Fault which is thought to strike in a north-westerly direction near the baseline. Other distinctly anomalous VLF-EM zones are also present, some of which are probably due to swampy ground.

Three very anomalous I.P. zones are outlined by the detailed 15 meter dipole coverage used. The most northern zone is apparently caused by a very shallow dipping target, which becomes more deeply buried as one moves to the northeast.

Another I.P. zone strikes through the area of the Maude Adams shaft while the third trends along the north-eastern edge of the grid.

Any of the above I.P. zones could be considered to be immediate drill targets.

II. RECOMMENDATIONS

While several of the Ryholite Resources properties on northern Texada Island (Nancy Bell/Silver Tip and Gem/Holly) have suitable drill targets already outlined by previous work, the following section provides more general recommendations as to possible geophysical techniques to use in exploring the property as a whole.

It would appear that magnetic surveying still offers the greatest chance of a major exploration success, in that the ideal target is thought to be a magnetite rich skarn zone with associated sulfide mineralization and gold. Therefore, a detailed, low level, helicopter borne magnetic survey is recommended to be flown over the entire area of interest. Such a survey will yield a substantially more detailed magnetic map than the 1975 survey, which was flow at 500 foot mean terrain clearance using a fixed wing aircraft. Also, a 30 to 50 meter elevation of the magnetic sensor should effectively filter the high frequency "hash" seen in much of the ground magnetometer data already collected.

An airborne electro-magnetic (A.E.M.) system configured to allow continuous resistivity determinations; ie. dighem, could be flown as part of the airborne phase of the exploration program. The resistivity map generated by such a system should clearly outline regional structures such as the Holly Fault, and could assist in mapping the various rock types involved. The effectiveness of an A.E.M. survey over the region may, however, be limited by the possible interference caused by man-made features such as 60 Hz power lines.

Once the airborne program has been completed and target areas outlined, ground magnetometer surveying should be used to evaluate the air mag anomalies at ground level. A decision could then be made to drill well-defined and interpretable magnetic anomalies, or to carry the selection process one step further by testing areas of high magnetic relief using the induced polarization (I.P.) and resistivity method. In this regard, it is recommended that a short I.P. test program, consisting of several detail lines, be conducted across the M-21 magnetic anomaly area in order to better evaluate the source or sources of the magnetic response.

Work already completed on the Nancy Bell/Silver Tip and Gem/Holly properties suggests that systematic detail I.P. and S.P. surveys on closely spaced lines is the best way to outline vein type mineralization in volcanics. I.P. and S.P. data could be acquired simultaneously using a multi-channel, time domain receiver. A variation of Frazer filtering could then be applied to the resulting differential SP data to yield more contourable results.

PACIFIC GEOPHYSICAL LIMITED

Paul A. Cartwright, P.Geoph.
Geophysicist

Dated: June 13, 1988

PAC:jl

APPENDIX C

Rock Geochemical Results

SURPRISE MOUNTAIN ASSAY RESULTS

ELEMENT	TYPE	WIDTH	Au	Au	Ag	As	Cu	Pb	Zn	Sb	W	Bi	B	Ni	Co	Mn	Mo	Th	Sr	Cd	V	La	Cr	Ba	U	Fe	Al	Na	K	Ca	P	Mg	Ti
SAMPLES		(m)	gm/t	PPB	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	%	%	%	%	%	%	%
XR31601				4	0.1	2	473	2	196	2	1	2	3	41	23	1575	1	1	32	1	174	6	45	3	5	7.42	3.60	0.02	0.02	3.84	0.045	3.19	0.35
XR31602				3	0.1	16	19	5	53	2	1	2	5	15	11	262	2	1	5	1	43	2	16	3	5	3.36	0.75	0.02	0.02	0.51	0.011	0.51	0.03
XR31603				35	0.2	43	19	16	56	3	1	2	4	10	14	211	6	1	10	1	20	2	8	3	5	3.85	0.40	0.01	0.02	0.78	0.012	0.23	0.01
XR31604				2	0.1	2	238	10	89	2	1	2	8	49	27	1435	1	1	33	2	249	8	91	10	5	9.03	3.45	0.03	0.05	3.74	0.057	3.40	0.70
XR31605				3	0.1	2	156	6	150	2	1	2	2	44	20	1698	1	1	23	1	208	6	74	4	5	7.34	3.53	0.02	0.01	1.24	0.051	3.43	0.02
XR31606				63	2.5	28	133	27	1856	2	1	2	4	16	51	930	2	1	11	18	57	2	16	3	5	10.03	1.33	0.01	0.02	0.84	0.004	1.21	0.01
XR31607				8	1.1	20	104	499	1028	2	1	2	2	25	23	1783	1	1	27	12	97	3	25	6	5	6.31	2.24	0.01	0.06	1.07	0.027	2.15	0.01
XR31608				98	22.7	45	12817	187	398	2	1	2	3	22	29	4447	2	1	199	6	72	4	21	8	5	9.24	1.63	0.01	0.09	5.38	0.045	1.43	0.01
XR31609				215	33.9	87	19153	267	314	2	1	7	2	34	42	1793	3	1	8	2	126	3	27	9	5	15.65	2.85	0.01	0.09	0.14	0.036	2.43	0.01
XR31610				52	17.0	23	11638	11	134	2	1	5	3	42	46	950	1	2	3	3	104	2	42	3	5	11.94	1.71	0.02	0.02	0.13	0.027	1.33	0.05
XR31611				220	4.9	51	912	9	28	2	4	7	4	12	47	46	20	2	2	1	15	2	3	4	5	16.32	0.09	0.01	0.03	0.02	0.002	0.03	0.04
XR31612				41	26.7	14	15552	30	409	2	1	3	2	42	16	1983	4	1	5	3	151	5	58	8	5	10.07	2.71	0.01	0.05	0.32	0.048	2.06	0.09
XR31614				95	1.1	162	27	13	100	2	1	2	8	58	36	1213	1	12	15	1	245	3	76	3	5	12.42	4.43	0.04	0.03	1.04	0.040	4.05	0.31
XR31615				1320	1.2	1091	75	8	42	2	1	2	4	21	58	384	3	12	15	1	43	2	13	6	5	13.56	0.68	0.01	0.01	1.89	0.010	0.66	0.02
XR31616				32	1.8	42	43	12	101	2	1	101	4	21	16	3276	1	3	119	1	114	4	20	2	5	5.59	2.15	0.02	0.01	17.91	0.017	1.63	0.12
XR31617				2	0.6	4	6	7	76	2	2	2	4	26	5	1944	1	3	70	1	116	2	33	2	5	3.52	2.13	0.01	0.01	10.24	0.016	1.61	0.06
XR31647				55	0.9	6	101	10	83	3	1	2	7	42	25	1163	2	13	32	1	245	9	66	17	5	8.63	4.00	0.02	0.02	1.52	0.066	3.64	0.28
XR31648				112	14.5	69	1919	1511	612	2	1	10	10	21	44	751	9	2	4	6	135	2	34	5	5	12.62	2.27	0.01	0.05	0.07	0.019	1.85	0.07
XR31649				34	0.9	32	220	15	99	2	1	2	2	25	27	1005	4	9	37	1	124	3	51	2	5	5.57	1.59	0.01	0.01	0.39	0.013	1.22	0.11
XR31650			2.68	2640	2.4	2047	84	35	184	2	1	26	2	35	198	774	3	2	1	1	66	2	37	5	5	18.06	5.99	0.01	0.03	0.16	0.007	0.87	0.07
XR31751			1.19	1300	1.9	1204	91	27	130	3	2	6	4	26	72	458	5	12	16	2	35	2	16	10	5	9.30	0.64	0.01	0.03	2.02	0.006	0.42	0.06
XR31752				199	1.0	54	33	15	93	3	1	2	9	47	26	560	2	13	14	1	177	5	66	3	5	9.51	1.12	0.03	0.02	0.97	0.043	1.18	0.10
XR31753				49	0.4	9	10	2	13	2	1	2	3	17	10	78	5	1	1	1	17	2	15	9	5	2.44	0.16	0.01	0.02	0.05	0.003	0.12	0.01
XR31754			18.1	18700	97.6	332	3424	55	2296	2	10	9	2	33	22	1824	7	4	37	34	108	4	29	5	7	12.35	2.07	0.02	0.03	5.63	0.026	1.64	0.16
XR31755				860	2.0	409	43	15	134	2	1	2	2	39	52	2767	2	4	150	1	114	6	21	3	8	8.70	2.45	0.02	0.02	8.19	0.018	1.48	0.02
XR31756				40	0.6	4	122	6	61	2	1	2	5	33	28	510	4	10	37	1	81	2	55	1	5	3.54	1.25	0.01	0.01	0.71	0.023	0.99	0.20
XR31757				132	0.8	27	96	9	59	2	1	2	7	28	19	3203	1	2	207	1	72	3	13	7	5	5.06	1.35	0.01	0.08	9.72	0.026	1.57	0.01
XR31758				78	0.4	24	11	11	94	2	1	2	3	33	32	4156	1	1	182	1	73	4	23	5	5	7.66	1.51	0.02	0.02	9.36	0.028	1.94	0.01
XR31759				179	0.9	63	40	8	113	3	1	2	3	27	24	3224	8	3	164	1	95	7	5	13	7	7.88	2.36	0.01	0.04	10.33	0.020	1.80	0.01
XR31760				93	30.7	19	29604	6	190	2	1	3	3	50	25	1675	4	13	19	4	178	6	69	6	5	11.50	2.99	0.03	0.03	0.69	0.048	2.13	0.12
XR31761				305	3.2	521	163	100	167	6	1	12	5	36	55	1273	6	4	3	1	130	2	44	5	5	12.35	2.86	0.01	0.02	0.13	0.026	1.76	0.01
XR31762				46	2.3	22	235	27	261	2	1	3	3	50	35	2809	2	12	16	1	260	5	78	7	5	10.90	5.05	0.02	0.04	0.46	0.057	4.24	0.02
XR31763				92	5.2	171	72	55	118	2	1	10	2	30	125	1130	8	13	8	1	95	2	20	4	5	15.45	1.93	0.01	0.02	0.64	0.014	1.26	0.01
XR31764			0.73	1120	1.0	68	315	17	642	2	3	3	2	35	28	1566	10	6	5	8	177	2	56	9	5	9.22	2.85	0.01	0.05	0.25	0.034	1.96	0.26
XR31765			16.48	16740	197.8	569	96280	985	29253	3	19	104	2	34	45	402	16	1	1	333	38	2	32	4	5	21.76	0.84	0.01	0.01	0.03	0.001	0.42	0.03
XR31766				860	13.0	68	1960	93	594	2	3	11	6	31	22	754	15	1	1	5	73	2	62	3	5	6.80	1.62	0.01	0.04	0.06	0.022	1.03	0.04
XR31767			5.75	5220	1.3	4	912	630	269	2	2	2	3	19	6	120	4	12	5	8	4	2	10	14	5	2.98	0.34	0.01	0.09	0.49	0.019	0.23	0.01
XR31768				66	1.8	192	80	25	161	2	1	28	8	39	87	1563	3	13	14	1	130	2	52	7	5	12.82	2.81	0.01	0.05	0.88	0.034	2.03	0.01
XR31769				108	2.7	205	196	42	121	2	1	99	5	42	194	1189	3	12	3	1	91	2	32	7	5	14.77	2.02	0.01	0.02	0.55	0.018	1.38	0.01
XR31770				54	3.9	124	499	20	181	2	1	4	3	39	74	1244	7	4	3	1	153	2	62	7	5	14.53	3.06	0.01	0.07	0.11	0.035	2.31	0.01
XR31771				78	1.6	197	160	12	54	2	1	2	2	19	62	243	6	1	1	1	43	2	13	5	5	17.53	0.66	0.01	0.01	0.03	0.008	0.44	0.01
XR31772				172	0.7	285	27	6	122	2	1	2	2	25	50	1410	4	9	10	1	130	4	28	6	5	11.04	2.39	0.01	0.03	0.43	0.036	1.63	0.01
XR31773				12	0.4	4	15	12	31	2	1	2	6	22	15	186	3	2	5	1	112	2	45	7	5	6.50	0.80	0.03	0.01	0.11	0.032	0.70	0.24
XR31774				52	0.3	2	367	2	59	2	1	2	6	73	26	322	2	11	15	1	183	6	56	11	5	7.13	1.19	0.06	0.02	0.99	0.084	0.93	0.37
XR32588			1.41	1625	4.3	43	782	12	40	2	1	2	2	15	14	1252	8	1	5	1	37	4	2	5	5	3.38	1.01	0.01	0.07	0.16	0.042	0.82	0.01
XR32589			64.90	60800	4.7	6	181	15	117	2	1	2	2	22	28	737	1	4	12	1	110	2	21	6	5	12.68	1.63	0.01	0.03	0.80	0.024	1.32	0.18

XR32590			3.16	3040	5.1	63	4562	19	72	2	1	3	8	26	23	2375	9	2	7	1	35	3	8	11	5	4.50	0.88	0.01	0.12	0.40	0.020	0.62	0.03
XR32591			1.89	1525	4.0	44	4434	18	126	2	1	5	10	39	25	1651	3	3	14	1	72	4	33	21	5	6.86	2.34	0.01	0.19	0.70	0.053	1.62	0.04
XR32592			5.04	3990	13.6	135	1900	178	92	7	1	10	5	33	21	329	12	1	4	2	36	3	13	5	5	5.72	0.63	0.01	0.13	0.16	0.047	0.29	0.01
XR32593			1.23	1230	4.9	56	2475	151	65	3	1	6	6	34	24	1381	3	2	9	1	65	4	21	8	5	4.74	1.43	0.02	0.12	1.85	0.028	0.93	0.02
XR32594			9.19	7950	8.1	155	3925	63	29	12	2	7	2	50	39	2257	16	1	50	2	37	4	10	6	5	8.27	0.60	0.01	0.11	4.69	0.041	0.41	0.01
XR32595				51	1.3	5	999	20	157	2	1	2	6	53	22	1220	1	2	7	1	178	5	70	3	5	6.50	2.94	0.02	0.01	0.70	0.052	2.40	0.35
XR32596				196	1.9	113	211	2857	10373	2	1	2	2	44	20	10142	1	1	113	150	168	6	57	7	5	5.73	2.42	0.02	0.06	5.58	0.046	1.64	0.02
XR32597				6	0.1	2	63	13	141	2	1	2	2	15	18	720	1	2	28	2	46	2	14	4	5	3.00	0.71	0.02	0.01	1.58	0.014	0.63	0.01
XR32598				14	0.3	7	44	46	188	2	1	2	6	45	17	562	1	1	5	2	171	2	76	3	5	8.71	2.21	0.02	0.01	0.13	0.065	1.81	0.03
XR32599				435	1.8	167	87	261	286	2	1	2	2	58	22	3588	1	3	29	1	109	3	51	4	5	6.39	2.19	0.01	0.06	1.85	0.047	1.36	0.01
XR32600			3.33	2380	27.2	295	759	23705	28497	13	1	2	7	42	22	1835	6	3	18	261	132	3	56	3	5	8.17	1.76	0.01	0.02	0.52	0.039	1.29	0.01
XR32601				685	3.9	152	282	2935	6748	2	3	2	2	15	14	3451	5	1	75	78	44	2	12	2	5	3.27	0.70	0.02	0.01	4.39	0.013	0.53	0.01
XR32602				640	4.4	76	327	2637	1338	2	1	2	9	48	19	2348	7	2	5	4	156	6	63	5	5	7.68	3.44	0.01	0.09	0.53	0.059	2.13	0.26
XR32603				495	5.1	44	979	3098	10806	2	1	2	2	22	11	1403	1	2	6	74	70	2	24	2	5	3.74	1.50	0.01	0.01	0.75	0.022	1.18	0.05
XR32604				31	0.1	4	36	67	106	2	1	2	2	33	18	650	1	1	5	1	51	2	13	7	5	5.52	2.27	0.02	0.03	0.23	0.014	2.67	0.09
XR32605	CHIP	0.60	12.21	10390	22.9	459	12492	355	550	2	1	18	2	64	40	1190	11	4	10	4	163	5	66	6	5	15.47	3.14	0.04	0.06	0.83	0.049	2.19	0.11
XR32606	CHIP	1.00	1.82	2065	47.1	156	11128	228	5625	2	2	16	2	38	24	1659	16	2	3	68	114	2	64	7	5	9.69	2.87	0.01	0.09	0.35	0.026	1.81	0.15
XR32607	CHIP	0.60	6.00	4870	39.8	177	7442	491	11911	2	1	44	3	55	38	2159	24	1	3	77	161	4	77	4	5	13.89	3.33	0.01	0.07	0.27	0.056	2.25	0.09
XR32608	CHIP	0.50	0.82	1212	3.1	32	306	706	3234	2	1	2	7	87	32	4141	1	1	6	22	184	5	137	5	5	9.56	5.35	0.01	0.09	0.74	0.051	3.85	0.22
XR32609				49	0.1	10	30	19	99	3	1	2	8	24	48	365	2	1	2	1	57	2	40	3	5	6.48	1.07	0.02	0.03	0.05	0.017	0.98	0.01
XR32610				1	0.2	3	8	10	82	3	1	2	4	23	7	393	1	1	2	1	51	2	55	9	5	2.30	1.13	0.03	0.06	0.12	0.014	1.00	0.02
XR32611				19	0.1	3	11	8	16	2	1	2	14	10	14	79	1	1	3	1	9	2	12	7	5	5.28	0.13	0.03	0.03	0.03	0.006	0.10	0.02
XR32612				3	0.1	6	9	8	132	2	1	2	3	41	14	875	1	1	25	1	122	3	81	6	5	4.18	2.27	0.01	0.02	1.49	0.034	2.13	0.01
XR32613				46	0.7	2	14	9	93	2	1	2	8	35	12	715	1	1	12	1	85	2	69	17	5	3.98	1.70	0.01	0.02	0.84	0.028	1.49	0.01
XR32614				242	0.1	13	20	15	151	2	1	2	2	41	50	720	1	1	3	1	134	2	82	6	6	8.64	2.67	0.01	0.04	0.14	0.032	2.07	0.19
XR32615				32	0.1	4	13	8	157	2	1	2	2	38	24	1537	1	1	12	1	150	2	71	17	5	6.66	3.31	0.01	0.03	0.59	0.027	2.68	0.01
XR32616				96	0.1	13	202	15	110	3	1	2	4	70	28	1085	1	1	31	1	225	3	127	4	6	7.91	3.42	0.01	0.01	2.72	0.068	3.58	0.30
XR32617				107	0.1	5	131	10	66	2	1	2	13	3	15	519	1	2	60	1	158	11	1	13	5	7.69	1.95	0.04	0.11	0.85	0.243	1.82	0.17
XR32618				8	0.2	113	28	10	103	3	1	2	8	8	10	1470	2	3	101	1	60	16	10	54	5	4.30	1.71	0.05	0.16	3.06	0.109	1.29	0.01
XR32619				392	0.3	231	28	14	62	2	1	2	7	6	8	280	2	3	6	1	18	6	4	28	5	4.82	0.91	0.01	0.16	0.18	0.077	0.53	0.01
XR32620			6.28	5295	1.1	100	659	18	380	2	1	3	10	93	23	903	1	1	60	4	106	3	127	10	5	6.65	2.32	0.01	0.06	3.21	0.025	2.05	0.06
XR32621				93	0.4	122	73	17	218	2	1	2	2	127	34	1366	1	1	64	1	105	2	131	8	6	8.04	2.87	0.01	0.07	1.71	0.033	2.69	0.01
XR32622			13.99	11573	8.5	38	786	3727	18028	2	1	2	4	22	13	975	6	1	28	131	80	2	35	6	5	3.68	1.49	0.03	0.04	5.36	0.023	0.93	0.11
XR32623			13.38	9913	73.2	195	10574	988	39666	3	3	75	2	43	52	994	57	2	2	306	82	2	54	5	5	16.79	1.55	0.01	0.07	0.16	0.025	1.09	0.10
XR32624				159	21.6	13	25971	33	559	2	1	3	2	19	24	1393	5	1	26	8	77	2	16	6	5	8.30	1.81	0.02	0.04	2.05	0.018	1.39	0.02
XR32625				99	17.1	15	16309	14	232	3	1	4	2	14	23	1997	2	1	63	4	53	2	8	5	5	7.44	0.93	0.01	0.03	3.59	0.013	0.67	0.05
XR32626				92	19.9	49	14051	16	95	2	1	6	4	29	71	430	1	2	2	2	58	2	22	2	5	19.42	0.79	0.03	0.01	0.05	0.013	0.62	0.01
XR32627				28	3.9	21	2365	23	93	3	1	2	2	23	38	1197	1	1	57	1	65	2	22	2	5	8.27	0.94	0.02	0.02	1.84	0.015	0.77	0.03
XR32628				614	37.1	18	9744	22558	64658	2	2	24	5	12	9	105	1	1	7	1544	13	2	15	3	5	7.43	0.15	0.03	0.01	0.33	0.001	0.12	0.02
XR32629				272	11.8	676	60	293	167	2	1	55	11	34	170	801	1	1	2	3	123	2	32	5	5	19.12	2.65	0.01	0.04	0.16	0.018	2.16	0.01
XR32630				69	9.0	28	2619	7192	7811	2	1	5	6	18	24	429	5	1	57	192	81	2	22	2	5	6.16	1.24	0.01	0.01	1.01	0.015	0.96	0.10
XR32637				9	0.2	2	288	4	176	2	1	2	2	43	22	1591	1	1	6	1	166	4	50	4	5	6.51	3.25	0.02	0.02	0.62	0.043	2.82	0.34
XR32638	CHIP	1.00		28	0.1	63	40	11	162	2	1	2	4	7	17	829	1	2	17	1	110	9	15	7	5	5.66	2.55	0.03	0.04	0.69	0.187	1.97	0.12
XR32639	CHIP	1.00		11	0.2	17	63	104	413	2	1	5	2	10	9	473	1	1	8	5	61	4	25	4	5	3.79	1.56	0.02	0.02	0.35	0.088	1.36	0.06
XR32640			1.17	1455	105.8	170	57362	1026	280	3	1	38	2	27	80	479	3	3	2	8	45	2	22	7	5	20.03	0.99	0.01	0.05	0.03	0.013	0.64	0.01
XR32641				102	18.8	353	6025	120	189	2	1	20	2	33	38	1630	10	2	2	2	191	2	51	4	5	12.97	2.95	0.01	0.03	0.11	0.054	2.38	0.01
XR32642				265	54.3	88	10745	109	181	2	2	10	9	30	78	695	5	2	2	1	67	2	39	5	5	16.41	1.50	0.01	0.04	0.06	0.016	1.03	0.01
XR32643				143	2.9	85	446	20	292	2	1	3	2	32	72	2782	2	2	4	1	154	2	57	7	5	15.77	3.63	0.01	0.05	0.18	0.040	3.04	0.03
XR32644				20	2.3	10	226	1169	3302	2	6	5	4	15	6	69	4	1	7	68	18	2	43	2	5	3.66	0.19	0.01	0.01	0.07	0.003	0.12	0.06
XR32645				31	0.3	30	35	15	44	2	2	3	4	19	15	286	1	1	2	1	74	2	51	2	5	6.73	0.95	0.01	0.01	0.14	0.010	0.77	0.23
XR32646	CHIP	1.50		17	0.5	28	218	234	260	2	1	2	2	42	24	873	1	1	6	2	195	3	81	4	5	7.34	2.74	0.02	0.02	0.67	0.046	2.47	0.60
XR32647				52	19.2	22	3360	26944	5137	3	10	21	2	34	16	640	1	1	4	110	146	2	69	2	5	6.57	1.92	0.02	0.01	0.36	0.031	1.67	0.26
XR32648				21	4.5	14	1958	2474	3408	3	5	4	2	36	19	690	2	1	11	68	128	2	69	9	5	6.27	2.10	0.01	0.02	0.69	0.025	1.99	0.39
XR32649				16	0.5	25	131	146	122	2	1	2	18	7	7	334	2	1	11	2	64	8	37	7	5	3.75	1.15	0.02	0.04	0.35	0.092	0.85	0.06
XR32650				3	0.4	8	200	44	237	2	1	2	3	41	15	769	1	1	4	1	188	4	99	3	5	5.36	2.72	0.02	0.01	0.44	0.050	2.88	0.27

XR32651			1	0.3	5	44	26	133	2	1	2	5	35	14	543	1	1	4	1	132	4	88	2	5	4.37	1.83	0.02	0.01	0.41	0.033	1.82	0.31
XR32652			54	0.9	87	72	17	90	2	1	3	2	28	24	355	8	1	4	1	93	2	60	2	5	8.74	1.28	0.02	0.01	0.31	0.033	1.18	0.24
XR32653			31	5.0	13	3526	21	63	2	1	2	2	17	25	209	5	1	4	1	53	2	51	7	5	5.22	0.85	0.01	0.04	0.12	0.031	0.66	0.03
XR32654			26	4.9	21	868	40	20	2	2	5	4	12	18	51	7	2	2	1	18	2	27	8	5	4.50	0.25	0.01	0.06	0.03	0.011	0.10	0.02
XR32665	CHIP	0.40	345	0.2	583	28	25	62	2	1	9	4	37	63	432	1	2	3	1	108	2	34	5	5	18.57	1.70	0.02	0.01	0.11	0.020	1.86	0.03
XR32666	CHIP	0.75	128	0.4	380	280	11	146	2	1	7	4	48	50	1288	1	1	27	1	193	2	56	3	5	16.44	2.62	0.17	0.24	2.06	0.033	2.89	0.28
XR32667			30	0.2	88	13	6	73	2	1	2	6	17	37	1881	2	1	79	1	45	2	14	11	5	8.31	0.90	0.01	0.05	5.38	0.011	1.11	0.01

CORTEZ GRID ASSAY RESULTS

ELEMENT	Au	Au	Ag	As	Cu	Pb	Zn	Sb	W	Bi	B	Ni	Co	Mn	Mo	Th	Sr	Cd	V	La	Cr	Ba	U	Fe	Al	Na	K	Ca	P	Mg	Ti
SAMPLES	gm/t	PPB	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	%	%	%	%	%	%	%
XR31851		260	19.8	29	10438	133	492	2	1	3	2	31	37	1728	6	1	11	8	112	3	40	6	5	14.66	2.43	0.01	0.06	1.96	0.036	1.73	0.09
XR31852		14	0.5	29	287	5	101	2	1	2	3	5	17	1901	11	1	122	2	59	7	10	22	5	3.47	2.35	0.10	0.05	2.45	0.162	1.63	0.11
XR31853		12	0.5	112	190	2	410	4	3	36	9	3	103	4575	1	1	78	5	16	12	9	3	5	4.94	0.97	0.01	0.01	10.88	0.050	1.08	0.03
XR31854		18	0.6	135	381	2	112	4	1	2	19	4	193	5843	16	1	20	3	3	2	6	3	5	7.21	0.08	0.01	0.01	3.80	0.011	0.13	0.01
XR31855		25	0.5	176	1052	3	226	2	9	38	2	3	68	6404	1	1	9	1	2	2	6	1	5	16.49	0.17	0.01	0.01	16.19	0.008	0.11	0.01
XR31856	13.96	12370	13.2	49	13857	23	252	3	1	2280	3	6	58	1271	1	1	10	1	3	2	5	38	5	5.84	0.18	0.01	0.01	4.10	0.010	0.77	0.01
XR31857		270	2.4	155	4982	2	153	2	1	72	2	2	33	5008	2	1	3	1	1	2	4	1	5	17.13	0.08	0.01	0.01	16.37	0.002	0.09	0.01
XR31858		395	0.3	118	539	4	14150	2	1	4	6	1	150	10017	1	1	67	150	1	2	7	2	5	5.60	0.05	0.01	0.01	11.84	0.004	0.41	0.01
XR31859		250	5.0	181	9052	4	20351	2	2	2	2	1	147	10256	1	1	16	246	1	2	8	1	5	9.89	0.07	0.01	0.01	11.91	0.001	0.07	0.01
XR31860		58	2.9	53	339	7	136	2	1	2	2	2	17	343	1	1	4	1	15	2	4	5	5	13.03	0.74	0.01	0.01	1.20	0.024	1.85	0.02
XR31861	4.48	4290	63.9	248	2805	6	159	2	1	2	2	2	312	75	1	5	3	1	294	2	11	7	5	41.83	0.17	0.01	0.02	0.06	0.016	0.22	0.01
XR31862	10.02	9285	94.6	151	65173	2	460	2	1	46	2	1	691	69	1	3	1	8	131	2	24	2	5	32.95	0.20	0.01	0.01	0.09	0.001	0.26	0.01
XR31863		465	10.0	170	17635	2	39935	3	103	2	3	1	329	10128	1	1	33	495	2	2	2	3	5	10.47	0.07	0.01	0.02	9.80	0.003	0.58	0.01
XR31864		520	31.0	77	44556	8	3263	2	14	2	2	27	248	3266	1	10	18	49	1	2	1	2	5	11.22	0.02	0.01	0.01	2.68	0.008	0.11	0.01
XR31865		665	16.9	283	21728	7	49037	2	3	7	6	3	267	4170	1	6	32	631	2	2	1	4	5	6.45	0.03	0.01	0.01	4.27	0.006	0.38	0.01
XR31947		1	0.5	17	378	4	320	3	3	2	13	8	10	1540	1	1	45	5	42	2	11	15	5	2.48	0.97	0.01	0.01	2.58	0.050	0.48	0.10
XR31948		18	0.7	48	95	25	79	2	1	2	6	5	29	433	2	1	227	2	40	6	5	90	5	2.88	4.21	0.39	0.12	3.21	0.181	0.62	0.10
XR31949	1.61	1985	0.7	47	22	27	117	2	1	3	4	5	17	408	3	1	127	3	107	7	7	44	5	2.86	5.81	0.21	0.26	4.43	0.360	1.26	0.13
XR31950		28	0.4	13	65	2	63	2	1	2	4	7	14	508	1	1	112	1	64	7	8	109	5	3.60	2.15	0.17	0.39	1.62	0.176	1.02	0.12
XR31976		92	0.6	38	204	8	175	2	1	3	24	1	11	932	1	7	5	1	10	2	1	14	5	45.75	0.09	0.01	0.01	0.14	0.014	0.04	0.01
XR31977		356	30.8	89	43440	2	77221	2	4	49	6	1	162	3797	4	1	9	976	3	2	8	6	5	9.18	0.22	0.01	0.01	0.66	0.002	0.36	0.01
XR31978		52	1.1	36	1396	2	4182	2	3	2	3	1	20	3680	6	1	100	48	4	6	6	27	5	3.78	2.97	0.05	0.13	1.56	0.041	1.41	0.08
XR31979	2.37	3885	31.3	35	68045	5	2469	4	11	35	11	7	139	2690	3	1	5	28	6	2	7	3	5	13.79	0.28	0.01	0.01	3.33	0.004	0.18	0.01
XR31980		44	0.3	43	99	8	83	4	1	2	3	6	16	227	7	1	97	1	43	9	7	44	5	3.98	1.47	0.12	0.13	1.35	0.180	0.91	0.13
XR31981	2.88	2740	46.0	6	99999	7	3322	3	1	54	3	2	250	2242	1	1	13	58	1	2	7	3	5	15.36	0.01	0.01	0.01	2.24	0.001	0.04	0.01
XR31982		6	0.6	40	162	24	116	3	1	2	18	1	11	497	2	2	396	3	80	13	5	80	5	3.92	4.43	0.41	0.29	3.44	0.221	0.60	0.11
XR31983		10	0.6	42	336	39	170	2	2	2	13	6	12	754	1	1	76	2	55	7	23	66	5	4.23	4.30	0.19	0.39	2.25	0.105	1.63	0.13
XR31984		34	0.4	50	41	11	71	2	1	2	2	15	7	329	6	1	239	3	13	2	2	6	5	2.95	1.51	0.01	0.02	19.83	0.017	5.31	0.01
XR31985		68	2.1	45	2005	3	31987	3	1	2	5	1	79	7287	1	1	15	367	1	2	5	18	5	5.82	0.07	0.01	0.02	2.69	0.002	0.22	0.01
XR31986	12.86	7825	22.8	501	32600	2	1864	2	1	6	2	14	245	1802	4	1	2	8	13	2	14	2	5	23.71	0.14	0.01	0.01	12.28	0.001	0.06	0.01
XR31987		116	1.2	46	1952	9	409	2	2	2	4	4	35	5865	71	2	14	3	31	7	11	5	5	6.25	1.33	0.01	0.01	5.72	0.094	0.50	0.11
XR31988		610	18.8	190	33217	7	7342	2	1	9	2	3	210	7839	1	1	8	84	1	2	9	2	5	8.90	0.06	0.01	0.01	2.38	0.003	0.31	0.01
XR31989		1	0.1	19	81	25	157	2	1	2	8	3	10	710	1	2	300	1	88	12	4	55	5	3.92	3.31	0.31	0.15	3.08	0.192	0.56	0.12
XR31990		26	0.3	40	249	25	102	2	1	2	7	5	15	320	2	1	271	2	66	9	6	37	5	2.84	5.23	0.37	0.44	4.01	0.206	0.57	0.13
XR31991		18	0.5	47	364	10	49	2	2	2	6	1	36	847	2	1	116	1	39	3	6	23	5	7.88	3.21	0.25	0.08	1.95	0.080	0.92	0.11
XR31992		10	0.1	34	86	2	77	2	1	7	2	1	6	267	1	5	4	1	11	2	1	8	5	53.31	0.16	0.01	0.02	0.07	0.004	0.10	0.01
XR31993	15.94	14685	15.4	18	1246	2	70	2	1	2	5	1	295	262	27	2	77	1	121	2	14	21	5	27.17	1.30	0.11	0.08	0.80	0.054	0.54	0.05
XR31994		6	0.3	2	59	2	94	2	5	2	2	2	1	152	1	1	242	1	2	2	1	3	5	0.26	0.01	0.01	0.01	38.13	0.003	0.25	0.01
XR31995		14	0.4	71	69	25	168	2	1	2	3	6	6	778	7	14	80	1	2	9	6	37	5	3.41	2.85	0.14	0.06	1.96	0.021	0.89	0.04
XR31996		39	4.3	22	6420	17	553	2	1	2	6	5	24	5408	23	3	140	5	51	8	16	8	5	5.86	2.98	0.01	0.02	4.13	0.165	1.99	0.09
XR31997		96	6.4	88	9153	17	773	2	40	39	2	4	76	7321	2	2	32	9	5	2	7	25	5	8.26	0.14	0.01	0.01	7.12	0.012	0.12	0.01
XR31998		485	13.4	137	20187	17	43546	2	22	30	2	3	249	11696	1	1	36	509	2	2	11	4	5	7.40	0.06	0.01	0.01	4.94	0.004	0.16	0.01
XR32043		24	0.3	25	155	2	64	2	1	2	17	7	16	303	1	1	65	1	40	7	6	33	5	3.58	1.26	0.06	0.22	1.23	0.162	0.75	0.12
XR32044		12	0.3	43	133	9	184	3	1	2	14	19	20	334	1	1	84	3	39	6	18	19	5	2.71	1.15	0.10	0.03	1.57	0.150	0.64	0.21
XR32045		40	2.5	113	3967	6	193	2	40	2	2	1	66	5322	1	1	13	7	1	2	4	2	6	9.81	0.07	0.01	0.01	12.84	0.004	0.08	0.01
XR32046		620	26.3	163	47673	5	7074	2	7	18	4	3	261	3627	1	1	35	96	1	2	9	4	5	10.24	0.03	0.01	0.01	5.20	0.001	0.14	0.01
XR32047		20	0.6	47	75	53	578	2	1	2	3	4	14	538	1	1	202	7	72	7	9	55	5	3.79	5.23	0.32	0.11	3.38	0.224	1.47	0.08
XR32048		56	0.5	16	314	11	105	2	1	4	2	6	18	325	2	1	289	2	56	10	7	62	5	4.28	2.86	0.29	0.13	2.54	0.243	0.58	0.14

XR32049		14	0.8	36	41	37	119	2	1	2	21	4	11	277	2	2	287	3	77	8	7	98	5	4.82	4.29	0.38	1.04	2.79	0.236	0.98	0.13
XR32050		6	0.2	32	60	5	43	3	3	3	3	9	13	333	1	1	146	2	50	8	10	27	5	2.61	1.77	0.04	0.09	2.19	0.255	0.68	0.16
XR32564	0.10		2.8	25	28	14	99999	2	4	104	10	1	757	5250	3	1	11	3816	2	2	7	2	5	3.65	0.02	0.01	0.01	1.48	0.005	0.40	0.01
XR32565	0.07		2.6	44	3731	7	27281	2	3	2	8	1	106	5313	1	3	59	354	1	2	1	2	5	2.58	0.01	0.01	0.01	8.62	0.005	0.26	0.01
XR32566	0.24		8.0	62	15414	7	5049	2	56	2	2	1	50	5834	1	3	8	56	4	2	1	1	5	10.36	0.19	0.01	0.03	9.58	0.006	0.10	0.01
XR32574		385	36.5	34	50677	11	99999	7	1	82	3	2	682	1823	3	1	4	1025	1	2	1	3	5	8.38	0.01	0.01	0.01	0.8	0.001	0.13	0.01
XR32575		79	2.3	50	6380	3	62502	2	4	3	3	2	300	3656	1	1	5	1025	1	2	13	2	5	3.2	0.01	0.02	0.01	1.3	0.001	0.06	0.01
XR32576		83	5	135	9499	8	99999	4	2	3	4	2	435	5268	1	1	15	1028	1	2	8	2	5	6.14	0.02	0.01	0.01	2.81	0.003	0.07	0.01

NORTH TEXADA ASSAY RESULTS

SAMPLE NUMBER	Au gm/t	Au PPB	Ag PPM	As PPM	Cu PPM	Pb PPM	Zn PPM	Sb PPM	W PPM	Bi PPM	B PPM	Ni PPM	Co PPM	Mn PPM	Mo PPM	Th PPM	Sr PPM	Cd PPM	V PPM	La PPM	Cr PPM	Ba PPM	Au PPM	Fe %	Al %	Na %	K %	Ca %	P %	Mg %	Ti %
XR31417		2	0.1	5	23	5	39	2	1	3	5	2	10	422	1	4	129	3	42	15	3	55	5	2.90	3.27	0.26	0.15	2.24	0.134	0.53	0.09
XR31418		4	0.1	3	7	9	56	3	1	2	10	3	12	798	1	1	180	2	54	9	5	45	5	2.90	2.41	0.08	0.15	2.33	0.178	1.01	0.11
XR31419		36	10.3	645	60	3654	5220	14	16	3	2	1	1	5214	1	1	197	37	2	2	1	5	5	1.92	0.08	0.01	0.01	39.03	0.008	0.31	0.01
XR31420		74	0.1	449	22	12	50	2	1	2	2	5	2	34130	1	1	154	5	10	2	3	4	5	10.66	0.14	0.01	0.01	19.19	0.007	3.42	0.01
XR31421		46	0.6	160	4	106	153	2	1	2	8	3	2	14425	1	1	246	6	3	2	1	10	5	5.17	0.07	0.01	0.01	19.20	0.003	4.11	0.01
XR31422		130	0.1	88	2	12	19	2	2	2	3	1	1	20789	1	1	263	4	1	4	2	3	5	5.06	0.04	0.01	0.01	27.18	0.004	3.00	0.01
XR31423		485	27.7	626	917	163	77827	14	3	17	2	1	1	21141	1	1	133	1018	1	2	3	2	5	6.34	0.05	0.01	0.01	14.56	0.005	3.46	0.01
XR31424		56	0.7	17	111	3	2040	3	1	2	5	74	33	607	1	1	140	18	84	2	103	47	5	5.27	5.35	0.24	1.31	4.14	0.057	1.44	0.21
XR31425		2	0.1	2	8	9	122	3	1	3	11	31	19	1047	1	5	4	1	37	2	1	16	5	41.15	0.16	0.02	0.02	0.71	0.016	0.08	0.01
XR31426		82	0.1	17	51	2	162	2	2	2	3	88	39	355	1	1	152	2	135	2	163	86	5	4.87	4.64	0.23	1.20	2.77	0.064	2.55	0.22
XR31427		26	0.1	16	34	2	86	4	1	2	7	96	37	296	1	1	115	1	95	2	139	72	5	3.54	3.75	0.16	0.55	2.65	0.066	1.72	0.24
XR31428		280	0.1	639	12	2	74	2	14	2	3	2	4	3846	1	1	11	3	14	2	1	5	5	16.61	0.67	0.01	0.01	13.36	0.045	0.18	0.02
XR31429		82	4	47	1051	16	101	5	1	2	14	23	13	429	18	1	17	1	17	2	8	7	5	3.45	0.50	0.01	0.02	0.58	0.064	0.56	0.01
XR31430		2	0.1	13	12	5	70	2	2	2	3	1	9	488	1	1	342	2	20	3	4	21	5	2.22	1.59	0.07	0.04	18.19	0.047	0.63	0.06
XR31431		8	0.2	8	237	2	31	2	1	2	3	81	31	971	1	1	73	1	32	3	34	15	5	7.92	1.29	0.06	0.38	6.70	0.048	0.31	0.14
XR31432		64	0.1	2	14	9	108	3	1	2	2	65	26	725	1	1	165	1	97	2	100	14	5	8.89	2.45	0.01	0.14	6.72	0.051	3.06	0.02
XR31433		138	0.8	234	1537	2	284	2	1	2	2	1	166	2778	2	1	22	3	8	3	19	9	5	12.83	0.40	0.01	0.01	4.45	0.003	0.20	0.01
XR31434		97	7.7	8	3626	21	3289	2	7	2	6	2	5	385	1	1	189	65	1	2	2	7	5	3.39	0.03	0.01	0.01	15.63	0.002	0.13	0.01
XR31435	9.74	7130	15.4	379	12419	2	173	2	13	2	3	3	27	1706	1	2	3	4	4	2	3	4	5	26.44	0.30	0.01	0.01	10.10	0.008	0.04	0.01
XR31436	1.47	1550	4.7	43	5009	4	244	2	1	2	2	6	21	1822	1	1	5	3	10	2	5	1	5	4.25	0.90	0.01	0.01	5.72	0.004	0.27	0.01
XR31437		22	0.2	156	281	3	43	2	3	2	2	1	8	2123	1	1	26	2	27	2	9	14	5	10.88	0.87	0.01	0.01	14.12	0.022	0.43	0.02
XR31438	8.88	7255	8.1	120	8273	4	172	2	1	3	7	28	85	519	1	4	2	2	9	2	6	6	5	38.40	0.19	0.01	0.02	0.52	0.011	0.17	0.01
XR31439		46	0.5	20	205	16	77	2	1	2	3	4	14	305	2	1	263	2	47	11	5	53	5	4.31	3.19	0.29	0.16	2.96	0.187	0.76	0.12
XR32551	0.03		0.1	12	21	14	22	2	2	2	3	1	1	778	1	1	492	1	2	2	1	4	5	0.36	0.01	0.01	0.08	40.36	0.002	0.21	0.01
XR32552	0.07		25.8	833	108	5672	6774	18	1	2	4	1	1	4920	1	7	230	33	3	2	3	5	5	2.38	0.05	0.01	0.02	31.97	0.007	0.28	0.01
XR32553	0.03		0.1	41	247	42	70	2	1	2	4	146	69	655	1	3	40	1	35	3	27	22	5	11.93	0.79	0.02	0.32	3.17	0.076	0.09	0.23
XR32556	0.03		0.1	6	39	9	104	2	1	2	3	11	14	623	1	2	143	1	132	7	7	94	5	4.34	2.89	0.17	0.22	1.97	0.171	1.52	0.14
XR32557	0.10		0.1	8	30	10	15	2	1	2	4	1	3	254	1	2	295	1	57	3	2	3	5	1.47	1.42	0.01	0.03	2.43	0.145	0.38	0.14
XR32558	0.14		0.2	198	11	17	27	2	2	2	2	8	3	9586	1	5	340	1	7	2	6	111	5	5.28	0.29	0.01	0.12	17.14	0.015	2.11	0.01
XR32559	0.03		0.1	167	24	12	61	2	1	2	2	2	1	31579	1	5	207	2	2	2	1	4	6	5.12	0.01	0.01	0.04	17.07	0.007	3.45	0.01
XR32560	0.07		1.8	79	51	12	52	2	2	2	2	3	2	14204	1	7	236	2	7	3	1	3	6	6.39	0.44	0.01	0.01	17.72	0.007	3.84	0.01
XR32561	0.17		9	424	1298	52	64480	2	3	7	2	1	1	22679	1	4	121	732	2	2	3	2	7	6.99	0.01	0.01	0.07	9.40	0.005	3.18	0.01
XR32562	0.27		8.4	958	1271	56	9783	2	1	2	8	1	1	18793	1	6	240	77	2	2	3	2	5	5.64	0.02	0.01	0.05	17.75	0.005	3.28	0.01
XR32563	0.10		0.4	80	67	14	253	2	1	2	2	2	1	34080	1	3	109	2	1	2	1	3	5	11.72	0.01	0.01	0.04	11.02	0.004	4.18	0.01
XR32567	4.18		2.9	89	154	12	203	2	1	2	2	1	1	17222	1	4	34	2	1	2	1	2	5	23.28	0.03	0.01	0.08	4.12	0.002	1.92	0.01
XR32568	0.03		0.1	18	80	3	56	2	1	2	2	1	1	3130	1	4	295	1	2	2	1	2	5	1.08	0.03	0.01	0.03	23.09	0.005	8.84	0.01
XR32569	4.35		0.1	8	36	28	69	4	1	2	2	1	1	562	1	2	88	1	2	2	1	2	5	1.07	0.19	0.01	0.08	7.74	0.005	0.30	0.01
XR32570		4	0.5	27	50	11	58	2	1	2	2	5	17	632	2	1	137	1	66	14	4	43	5	4.36	2.01	0.11	0.07	1.86	0.182	1.29	0.13
XR32571		29	0.3	149	8	22	91	2	1	2	20	2	21	786	1	1	4	1	3	2	1	6	5	39.93	0.06	0.02	0.02	1.31	0.009	0.09	0.01
XR32572	8.64	6650	1.1	1071	175	6	15	2	3	2	2	1	3	3018	1	1	12	1	4	2	1	3	5	8.21	0.33	0.01	0.01	9.29	0.027	0.19	0.01
XR32573	1.58	1620	0.9	179	144	19	59	2	12	2	2	4	20	1455	1	3	6	2	7	3	1	11	5	32.03	0.30	0.03	0.01	5.65	0.009	0.12	0.01
XR32577		430	0.4	24	111	12	520	2	1	2	3	7	24	404	1	1	209	5	92	5	3	59	5	3.90	4.76	0.21	0.48	3.13	0.127	1.04	0.14

XR32578		1	0.5	4	35	2	358	2	2	2	2	1	1	206	1	1	288	4	1	2	1	2	7	0.05	0.01	0.01	0.01	41.10	0.002	0.11	0.01
XR32579		1	0.5	16	9	4	94	2	1	2	10	2	4	1112	1	1	116	1	26	15	1	54	5	1.17	1.14	0.01	0.02	2.94	0.403	0.38	0.09
XR32580		1	0.5	2	6	2	48	2	4	2	2	1	1	246	1	1	305	1	1	2	1	9	7	0.05	0.01	0.01	0.01	41.34	0.002	0.11	0.01
XR32581		1	0.3	14	30	5	92	2	1	2	2	4	9	598	1	1	130	1	37	11	1	40	5	1.94	1.37	0.04	0.16	2.12	0.174	0.84	0.12
XR32582	49.85	48905	7.7	36	2405	39	309	5	1	2	2	5	4	268	4	1	69	4	4	2	1	4	5	7.48	0.73	0.01	0.01	5.84	0.005	0.33	0.01
XR32583	4.05	2710	1.2	17	125	79	36	20	3	2	2	1	1	699	1	1	235	1	1	2	1	2	5	0.68	0.07	0.01	0.01	27.90	0.003	0.20	0.01
XR32584		15	0.5	4	9	8	18	2	3	2	2	1	1	67	1	1	418	1	1	2	1	1	9	0.04	0.01	0.01	0.01	40.03	0.007	0.21	0.01
XR32585		395	0.7	143	656	15	138	2	4	2	4	6	12	1696	1	1	22	2	19	2	1	4	5	22.41	0.39	0.01	0.02	5.73	0.005	0.19	0.01
XR32586	6.31	5280	0.6	397	64	8	57	2	4	2	2	3	4	3824	1	1	9	1	13	2	2	5	5	9.78	0.60	0.01	0.01	8.91	0.024	0.17	0.01
XR32587		78	0.3	113	29	15	100	2	9	2	2	4	7	2147	1	2	4	2	11	2	1	6	5	26.15	0.44	0.04	0.02	5.09	0.006	0.12	0.01
XR32668		138	0.1	14	63	11	44	2	2	2	4	92	37	214	1	1	139	1	97	2	133	47	5	5.52	3.55	0.12	0.50	2.53	0.064	0.86	0.29
XR32669		9	0.1	10	55	7	134	2	1	2	2	63	19	429	1	1	57	1	172	2	170	58	5	6.15	4.40	0.16	1.61	1.04	0.046	3.47	0.24
XR32670		38	0.3	9	203	9	118	2	1	2	2	43	19	415	1	1	49	1	72	2	63	38	5	3.87	1.69	0.07	0.20	0.78	0.051	1.53	0.20
XR32671		102	0.5	9	441	7	702	2	1	2	2	115	52	450	1	1	105	6	105	2	127	45	5	5.40	3.40	0.19	1.34	1.72	0.056	2.09	0.25
XR32672		52	0.2	11	30	9	34	2	1	2	3	6	24	161	2	3	77	1	44	9	7	35	5	4.01	1.10	0.08	0.15	0.93	0.177	0.47	0.14
XR32901		305	4.4	101	569	10	101	2	1	2	2	31	131	1039	1	2	19	1	40	2	29	7	5	20.72	1.25	0.01	0.03	0.82	0.057	1.03	0.09
XR32902		46	0.1	8	45	9	50	2	1	2	2	11	7	852	1	1	89	1	38	5	18	15	5	2.17	1.26	0.02	0.01	3.19	0.122	0.77	0.17
XR32903		275	0.7	5	395	9	75	2	1	2	3	15	34	430	3	2	56	1	92	7	13	20	5	7.35	1.74	0.05	0.09	1.05	0.177	1.70	0.15
XR32904		28	0.2	139	100	4	72	4	5	2	8	64	20	477	1	1	45	2	157	2	135	48	5	9.76	2.69	0.07	0.23	0.52	0.058	1.74	0.13
XR32905		49	0.5	147	479	5	539	6	1	2	3	63	66	331	3	1	38	6	138	2	146	24	5	14.39	1.73	0.07	0.67	0.67	0.062	1.13	0.25

APPENDIX D

Boniwell Airborne Geophysical Report

RESULTS OF A

HELICOPTER-BORNE MULTISENSOR SURVEY

TEXADA ISLAND, B.C.

for

FREEPORT-MCMORAN GOLD COMPANY

ECHO BAY MINES LTD.

BP RESOURCES CANADA LIMITED

by

J. B. Boniwell

Exploration Geophysical Consultant

December 8, 1988

EXCALIBUR
INTERNATIONAL
CONSULTANTS LTD.

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-2035	" " " " , SE Sheet	1:10,000
-2036	Plan of Interpretation, NW Sheet	1:10,000
-2037	" " , Central Sheet	1:10,000
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INTRODUCTION

Economic deposits of metal ores carrying gold, copper and iron have been exploited in the northwestern quarter of Texada Island, B.C. at various times over the years. These mining operations have all tended to be small according to market conditions and the size of the deposits themselves. The often good grades of the contained gold however have recently provided a spur to a re-examination of the mineral potential of the entire region.

All mined deposits occur within skarns. As a consequence, lithologic contacts and structures constitute essential ingredients to a likely ore setting, and are sought to be defined in any exploration mounted for new, and presumably buried, deposits. To this purpose, a helicopter-borne multi-sensor surveying of the region was recently effected to yield the desired information in the requisite detail. Results of this geophysical mapping are presented and discussed within.

DESCRIPTION OF SURVEY

The survey was conducted at a mean terrain clearance of 60 m for the aircraft. The various suspended sensors traversed the area at lesser elevations, viz. approximately 50 m for the VLF antennae, 45 m for the high sensitivity magnetometer, 30 m for the em. bird. Coverage was effected by a systematic traversing of flight lines set 125 m apart and oriented NE-SW. Navigation was controlled by a Syledis, SR3 radio positioning system, backed up by an in-flight VHS colour video camera. A total of 750 line kms was flown thusly in survey.

The survey data were acquired digitally. After flight path recovery and due processing, they have been presented in plan, either in the form of stacked profiles or as contours. The stacked profiles mode was the preferred way to display the VLF results. Both total field and vertical field out-of-phase measurements have been plotted against their lines of recording to show the variation in these two VLF parameters across the area to an appropriate sensitivity.

By contrast, contours have been used with effect to exhibit the spatial distribution of change in magnetic and electromagnetic response through the area. The former set, considered the prime output from the survey, has been accentuated by the use of colour contour lines, coded by amplitude. This particular presentation has been supplied by Tesla-10 Ltd. of Mississauga, Ontario. The electromagnetic data for their part have been rendered into an apparent resistivity determination for the overflown ground. A logarithmic contour interval has been adopted for the presentation to cope with the large dynamic range involved.

The principal contractor for the data acquisition and processing has been Aerodat Limited, also of Mississauga, Ontario. They have produced all map presentations, -- with the one exception noted above, plus the interpretational overlays which are generated by considerations undertaken herewithin. In addition, an orthophoto mosaic has been independently compiled (R. T. Marcroft & Associates) as a future base plan for the area (at 1:10,000).

For the purpose of the present interpretation, this map scale of 1:10,000 has been co-opted as most practical and convenient. A set of (seven) 1:5000 maps is available for the more detailed refinemenents that future investigations and research may supply.

DISCUSSION OF RESULTS

A. Lithologic Considerations

The contoured magnetics (Dwg. Nos. EIC-2033,4,5) provide the most new information about the region's rock types and their distribution.

There is good magnetic relief across the area, ranging over 3000 nT. The highest peaks are either caused by intruded hornblende diorites or by magnetic metasomatic skarns on the evidence. The Quatsino Formation of carbonate rocks supplies the contrasting low background. In between these extremes of range lies a suite of mafic volcanics (the Karmutsen Group), plus a number of other intrusions which appear more granitic in composition. By report (Forster, 1988), granodiorites form the largest intrusive bodies in the region.

Pinning down lithologic boundaries from the magnetics is therefore an exercise which holds its ambiguities. Moreover the formational rocks are either flat-lying or very gently dipping (to the SE). Hence any magnetic contrast between conformable units would appear either very subtle or gradational. Happily as is noted again later, many of the contacts between the two main rock suites are in fact fault contacts, and so become much more discernible in magnetic terms. Many of the intrusive contacts typically are also likely to be quite steep.

Thus, proceeding empirically and extrapolating from outcrop identifications, it is possible to synthesize the lithologic constitution of the survey area as shown (Dwg. Nos. EIC-2036,7,8). What is most difficult to portray, and of course sometimes even to perceive, is the buried intrusion, which is itself variably magnetic, and which is covered by a capping of non-magnetic limestones or modestly magnetic basalts. Since the present exploration of the area requires to know where the intrusions are and how they behave in depth, the effort has been especially made to indicate their sub-surface extent herewithin.

It would appear as a consequence that there is considerably more intrusion in the area than previously allowed for by surface mapping. Much of it naturally is hidden, but large stocks of hornblende-rich diorite manifestly underlie substantial segments of the area, e.g. east of Raven Bay in the southeast quadrant. What is notable by way of exception is that there appears no magnetic floor to the large block of limestone in the area centre. This emerges as quite disconcerting since it is one of the geologic presumptions of the region that there should be some kind of igneous basement to these sediments. What could exist here of course is a non-magnetic granodiorite, but failing any direct evidence of its existence, it is difficult to prescribe it with any authority.

The above-noted limestone block is in fact a commanding feature in the magnetics. There is nothing else quite like it. It is sharp-edged due to faulting, but within its confines the smoothness of change implies a considerable thickness to the encompassed carbonate rocks, maybe as much as 300 m. This is the probability that has to be faced if there is no paramagnetic felsic intrusion higher in the column.

The other limestone depositions elsewhere in the area are recognizable by a similarly smooth magnetic texture, but in their cases invariably this characteristic overprints an undertone of contrasting magnetic activity, be it volcanic or intrusive in origin. This circumstance satisfies the concept of a younger limestone formation overlying volcanic rocks which are older, and a suite of intrusion which invades both.

B. Structural Considerations

The structure of the area is described by both the magnetic, VLF and resistivity data. In many ways, the magnetics are the most descriptive. This has much to do with the projection that block faulting is very much a reigning probability in the region, and that the younger limestones often occur where they do because of it.

a) Magnetics

The most prominent faulting evident in the magnetics bears NW-SE. One such structure is area-wide and is plainly seen in the processed data. There are at least two slightly lesser ones. Between them they bracket the island and manifestly govern its configuration.

Other faults on other headings are clearly present in the area. Some of the most dramatic are those which bear NE. This is best seen in the central sector of the area. Here, by the way they juxtapose magnetically quiet limestones against the comparatively active volcanics, a block faulting is implied.

Since the Quatsino Formation is held to be younger than the Karmutsen (Muller, 1977), the limestones thus appear to infill down-thrown graben blocks. For the sector north of the old Texada Island iron mines, a graben approximately 3.5 kms wide and oriented 45 T can, on this basis, be fairly assumed.

In fact looking at most of the major Karmutsen/Quatsino boundaries implicit to the magnetics and supported by outcrop control, there is the widespread indication that they are all largely fault contacts. However it is only in the central sector that the cross-structural components controlling limestone occurrence are so starkly displayed.

What is remarkable about many of the magnetically defined faults in the area is that they should yield such pronounced magnetic troughs. This is especially true of the regional faults typical of the island's tectonics. Not only do these appear deeply incised in the higher magnetic domains, they exhibit a substantial width as well (up to 100 m). This could simply mean that some of these structures are multi-axial or in effect shear zones, or it could mean that they have afforded passage at some later stage of invading geothermal fluids which severely altered the wall-rocks (through magnetite depletion). There is a natural logic in accepting the latter possibility since it can be tied to the area's intrusions which patently post-date the Karmutsen and Quatsino rocks. By the same token, some of the intrusive emplacements can be pinned to these same structures, for instance there are several occasions where a projected plug sits athwart, and apparently blocks, a throughgoing fault lineament. Examples exist at 5100N/3000E, 6850N/11900E on the one structure, and at 1550N/10250E on another.

These incidences all occur on the major NW-SE faulting of the region. However it is evident that many of the intrusions mapped by geophysics in the area locate where they do because of other structural elements, that is, faults on other headings, especially in the cross-structural sense. This implies that contemporary or pre-existing fault intersections have played an important part in localizing the small intrusive centres that dot and to a certain extent characterize the geology of the island. It also appears highly likely that there has been fault movement post-intrusion -- after all, this whole region falls within a still very active belt on the global time-scale of plate tectonics. Thus it is not unusual to observe in the magnetics evidence of branch faulting which overtly passes around the intrusive body now in place. This structural component is presumed to be relatively recent, and it is interesting to note that the VLF survey response tends to favour it wherever it exists.

b) VLF

Compared to the magnetics, the VLF measurement inherently suffers because of several reasons, viz. i) it can not cope equitably with all directions in the area faults may assume, ii) it is more prey to culture, and iii) to some perceptible extent it is affected by surface weathering in places.

This last comes as a bit of a surprise but the effect shows up in the data as a component which is topographically dependent. This signifies that VLF currents in these cases are being preferentially channelled through the active weathering layer and thus fairly faithfully follow land forms, no matter how modestly sized they may be.

To off-set this aspect of the VLF data, each individual flight line is compared with the pertaining topographic profile, and where positive anomaly coincides with ridges, or conversely inverse responses with valleys, the result is discounted, without -- importantly -- it being eliminated entirely. Only if the relationship persists along topographic strike on a one-to-one basis consistently is the result attributed to topography wholly.

It is clear from such treatment that some parts of the area are manifestly more weathered than others. These deserve to be identified since within them VLF will have not penetrated as far sub-surface as in other sectors. Besides, such weathered sectors could hold geologic, geochemical and mineral implications, even if these are yet to be perceived. On this basis, a VLF-directed discrimination of near-surface weathering conditions has been made as shown (Dwg. Nos. EIC-2036,7,8).

Another environmental circumstance impinging on the VLF data is the sea water/land interface represented by the coast-line. It of course is a peripheral condition and really is not deleterious to the survey's objectives. Cultural effects are another matter. They arise chiefly from power-lines, these essentially following the main roads of the island which in turn tend to follow topographic feature (valleys). Thus fault lines and power lines promise to coincide in places, possibly to the enhancement of the former, but not in any way predictably. In addition in the vicinity of the Gillies Bay airport, sporadic aircraft radio transmissions have rendered several sections of the current VLF traversing unreliable.

Nevertheless despite these drawbacks, the VLF data have aided in the delineation of major faulting, and in places have provided a definition of more local structures which do not appear in the magnetics and so supplied indications which otherwise would not have been had.

Just the same, what begs most explanation is the failure of the VLF survey to detect the huge NW-SE structural axes so plainly expressed in the magnetics. This is not a question of poor orientation wih respect to the broadcast field(s) utilized, almost the exact contrary in fact, particularly where NLK is concerned. The inescapable conclusion therefore is that these structures in the main do not conduct. This appears extraordinary, so much so that a rather sweeping answer is proposed, namely that these fault lineaments, already recognized as probable alteration loci, are further distinguished by the presence of quartz in large quantities. In short, these major lines of weakness have been subsequently healed by the silica flooding they have endured. It is supposed that this further evidence of alteration is consanguineous with the geothermal fluid incursion already postulated.

c. Resistivity

The resistivity measurements derive from a pair of horizontal coplanar coils operating at 4175 Hz. The ensuing calculations assume a 200 m conductive layer . The results display a predictably wide range of values, from sea-water (0.2 ohm-metres) to bare rock outcroppings on land (>5000 ohm-metres), but do so at times in surprising ways.

Most notable are the relatively large resistivity lows that are seen to occur in the northwest and southeast sectors of the survey area. They characteristically are insensitive to resident lithologies. Since in both cases there is a corridor connection to the sea, it can be fairly assumed that what has happened is a marine incursion, or incursions, at some time in the past following structurally controlled lineaments. Significantly both affected sectors coincide with topographically lower ground in general.

When these sea incursions occurred is indeterminate, except that in geologic time it needs to be post-Triassic. Given that Texada Island lies near a plate edge within an historically active seismic belt, it is not difficult to conceive of differential movement on faults, even of repeated tidal waves, which could have caused local sea flooding of such duration that it would have permanently altered the resistivities of the innundated ground. In addition there have been sea level fluctuations over time due to the various ice ages.

What is a bit more difficult to explain is the resistivity low area that occurs seemingly totally contained within a regime of resistivity high. Several of these exist, quite commonly surrounding or in extension from a lake. The lakes themselves typically conduct. Rather than looking for another independent cause, such as pollution or metallic salts in solution, it seems more appropriate to attribute these resistivity lows again to sea-water flooding but whose access remains undefined by any one of a number of reasons, e.g. structural movement post-flooding, erosion, narrowed channels, incomplete sampling by the present survey. The Emily Lake locale provides an excellent case where the sea access is clearly indicated, even though the definition of its fault-controlled passage has not been fully made by the present resistivity measurements.

The resistivity data thusly yields structural information for the area, albeit not consistently. Such contributions have been absorbed into the interpretation where shown (Dwg. Nos. EIC-2036,7,8). Finally, it needs be noted there is some noise in the data set which is overtly due to power lines. These are fairly readily correlatable with roads.

C. Stratigraphic Considerations

The two formational groups of rocks, the Quatsino limestones, and the Karmutsen volcanics, are flat lying and provide no discernible marker horizons. As noted already, the Quatsino is considered younger than the Karmutsen (Muller, 1977) but both are presumed to have been deposited in the middle to upper Triassic. The contact between them as seen is often a fault contact, although the possibility of other forms of interfacing remains. However these considerations are largely academic in nature since it is not perceived that stratigraphy per se has exerted any significant control on mineral localization in the area.

D. Mineral Considerations

There are two main kinds of mineral (metallic) occurrence within the survey area.

i) Skarn Deposits

The most important, on the record of past production, are the skarn-hosted deposits. Wherever there are carbonate rocks, this class of deposit is possible. Typically they are high-grade metasomatic concentrations of iron oxides or sulphides carrying varying amounts of iron, copper and gold at or near a limestone contact with diorite (usually, but sometimes with volcanics). These deposits themselves can be broken down into two sub-groups, those that are iron-rich and those that are copper-rich. It is the latter which are auriferous, on the evidence.

However no skarn mineralization can be ignored simply because it appears to belong to the iron-rich sub-group. At the Texada Mines Ltd. deposits on the west side of the island, copper-gold sulphide mineralization was encountered on the fringes of the massive magnetite ore which historically was mined for its iron. Only in the later stages of the mine life was copper recovered. Gold tended to be neglected -- it was rarely assayed for, even in the copper-rich sections, although it was sufficiently present in the resultant copper concentrates to earn credits aggregating 31,200 ozs (C. Forster, 1988).

The sulphidic skarns clearly are the priority target. In geophysical terms they are modestly magnetic largely due to pyrrhotite. When they occur separately from the magnetitic iron-rich skarns, they show up as relative minor proturbances or fingerings from some proximal magnetic centre reflecting the local intrusion. Empirically the majority of known deposits and prospects removed from the Texada Mines Ltd. sub-group generally manifest themselves in this manner. As a consequence, the search herein undertaken for new deposits, or extensions of known ones, concentrates on this idiosyncracy of occurrence.

From this standpoint then, a suite of what are called prospective localities can be discriminated. This is not difficult in the primary screening. A number of possibilities commend themselves, at least 30 in total. These all occur in the Quatsino domain in the vicinity of contacts and projected intrusion, whether near-surface or in depth. They are specifically outlined and numbered in the accompanying presentation (Dwg. Nos. EIC-2036,7,8).

Inevitably however, there is bound to be ambiguity and an overlooking of other possibilities. As to be expected, there are exceptions to the general rule that mineralized skarns should possess a discernible magnetic expression. Among the known deposits, the Copper Queen is notably devoid of magnetic indication. This can in part be attributed to a high magnetic gradient which is in place in background here, in part to the vertical pipe-like aspects of the occurrence. Nevertheless deposits like this are important, especially since they represent near-surface manifestations of an alteration welling up from depth.

It therefore needs to be acknowledged that not all possibilities for new occurrence will be recognizable in the geophysics, even if the mineralogy does not change appreciably. However should pyrrhotite ever be supplanted by pyrite as the major iron sulphide component of a potential ore, then it is at once obvious that the chances of missing something are increased substantially. In some skarn deposits, this is a real possibility, as evidenced by the Yew deposit in the present survey area.

The Yew deposit in fact presents a further variation on the group setting. It involves a thin lens of marbleized limestone embedded in volcanics. As such, it is typically a manto deposit. Overtly, it is extremely size-limited, but the mineralization at issue is pyrite-rich and auriferous. In the Ideal Limestone quarry, another similar occurrence has been unearthed; viz. heavy pyrite lenses interbedded with limestones themselves. The latter incidences locate close to the faulted volcanic contact.

This problem of identification then is difficult enough, but it seemingly worsens when the second chief type of mineral occurrence is considered.

ii) Quartz Vein Deposits

There is within the region a number of gold prospects that are best classified as quartz vein occurrences. As known, they mostly fall within the volcanic domain and are intimately related to structure. To date, none have sustained a recorded production.

Typically these zones contain some associated sulphides, commonly pyrite. Unless these latter become massive over significant dimensions, the likelihood is that they will not be apparent in the present data directly. However there is the possibility they might express themselves indirectly through their associated alteration. Specifically, if the host domain is characterized by a relatively high level of magnetic background and the alteration involves a magnetite depletion through hydrothermal action, then this alteration could potentially show up as an unusual magnetic low, this likely confined to structural zones as already noted, but most particularly to their points of intersection with contacts and/or other structures.

Working from this basis, it is possible to discern several localities where this combination of events may have taken place. These are individually marked in the interpretational overlay. Unhappily, however, there is nothing hugely unique about them, and even if they do represent alteration as prescribed, there is no assurance that gold is present.

FUTURE EXPLORATION

It is evident from the above considerations that extra information is required. Apart from what may be gleaned from surface prospecting and geochemical sampling, the next step geophysically would be to establish the presence of sulphides within each chosen locality, no matter the incidence-type envisaged. Empirically, based on experience for the region, this would be best effected by induced polarization (IP), although it has been found that self-potential (SP) can be extremely useful in screening the near-surface possibilities. It is suggested in consequence that all cited localities form targets for a test programme for any future endeavour directed to economic gold occurrence in the survey area.

CONCLUSIONS AND RECOMMENDATIONS

The air survey completed over the joint ground held by the three participating parties on Texada Island has proven itself to be quite revealing. The magnetics in particular furnish the kind of detail which constitutes an invaluable data base for the area and for all future exploration carried out within it.

By comparison the other two methods contemporaneously flown, viz. VLF and em, have not fared as well. They have turned out not to be as definitive as hoped, although it can still be claimed that their short-falls in themselves hold geologic significance. For example, the lack of VLF response from some of the major faults transecting the area can be ascribed to a widespread silica flooding of their channelways; again, the paucity of strong em. anomaly for most of the area presumes resistive rocks typically and sulphide incidences of less than a massive nature. The zones of alteration that may be expected from a buried skarn deposit have particularly eluded an electromagnetic definition.

Notwithstanding, there is much that can be recognized and reasonably projected which allows the discernment of localities of high prospective interest through the area. These logically can be expected to form the heart of any future mineral investigation conducted at scale through this environment. A list of such localities is provided in an Appendix.

In addition, it is concluded that two types of gold occurrence exist in the geophysics, that is, each type manifests itself differently. Simply put, one involves a magnetic high, the other a low. The first group embraces the skarn-hosted deposits, the second the quartz vein occurrences. Both are structurally controlled.

It is recommended that a programme of follow-up be pursued in each case. In its details, the programme will not vary much between one target type and the other, at least in its initial stages. Each locality, or a closely bunched group of localities, warrants gridding. Geological mapping, geochemical sampling and geophysical surveying are to be carried out thereon in a systematic way.

For the geophysics, it is specifically recommended that a VLF dip angle survey be extended to these grids since it is anticipated that on the ground such measurements will furnish much more detailed information of structure than has been achieved in the air by the method. Self-potential (SP) is also suggested in this first phase since it has a record of working well in the regional environment, especially for the near-surface skarn type mineralization. Once this primary work has been completed and new potential target sections emerge, it is recommended that a second stage involving induced polarization/resistivity (IP) traversing be undertaken to refine the in-depth knowledge of a suspected mineral occurrence and to aid its test drilling.

It is to be noted that IP surveying has had some problems in the past in achieving effective current penetration. It is recommended therefore that care be practised in preparing power electrode positions -- to ensure good contacts in rocky surface conditions -- and that flexibility of approach be maintained. Other array configurations including the gradient array might, for instance, prove more advantageous in certain prevailing circumstances.

It is believed that these follow-up steps preliminary to major drilling will, in conjunction with the geological and geochemical findings, do justice to the potentialities produced by the air-survey results.

JBB:sb

December 8, 1988

J. B. Boniwell

Exploration Geophysical Consultant

APPENDIX

LIST OF PROSPECTIVE LOCALITIES

NW TEXADA ISLAND, B.C.

Identifying No.	Setting Type	Remarks
EB-1	Skarn	Minor magnetic ridges running W from Paris showing. Bounded by faults. Occurs in limestone domain at Blubber Bay. Purposely excluded is local magnetic peaking at Blubber Bay which is probably due to culture.
EB-2	Skarn	Manifest extension of the Paris magnetic setting to the SE. Locality includes the Paris showing itself, also a new reported prospect at Canada Trench. Major faults intersect in proximity.

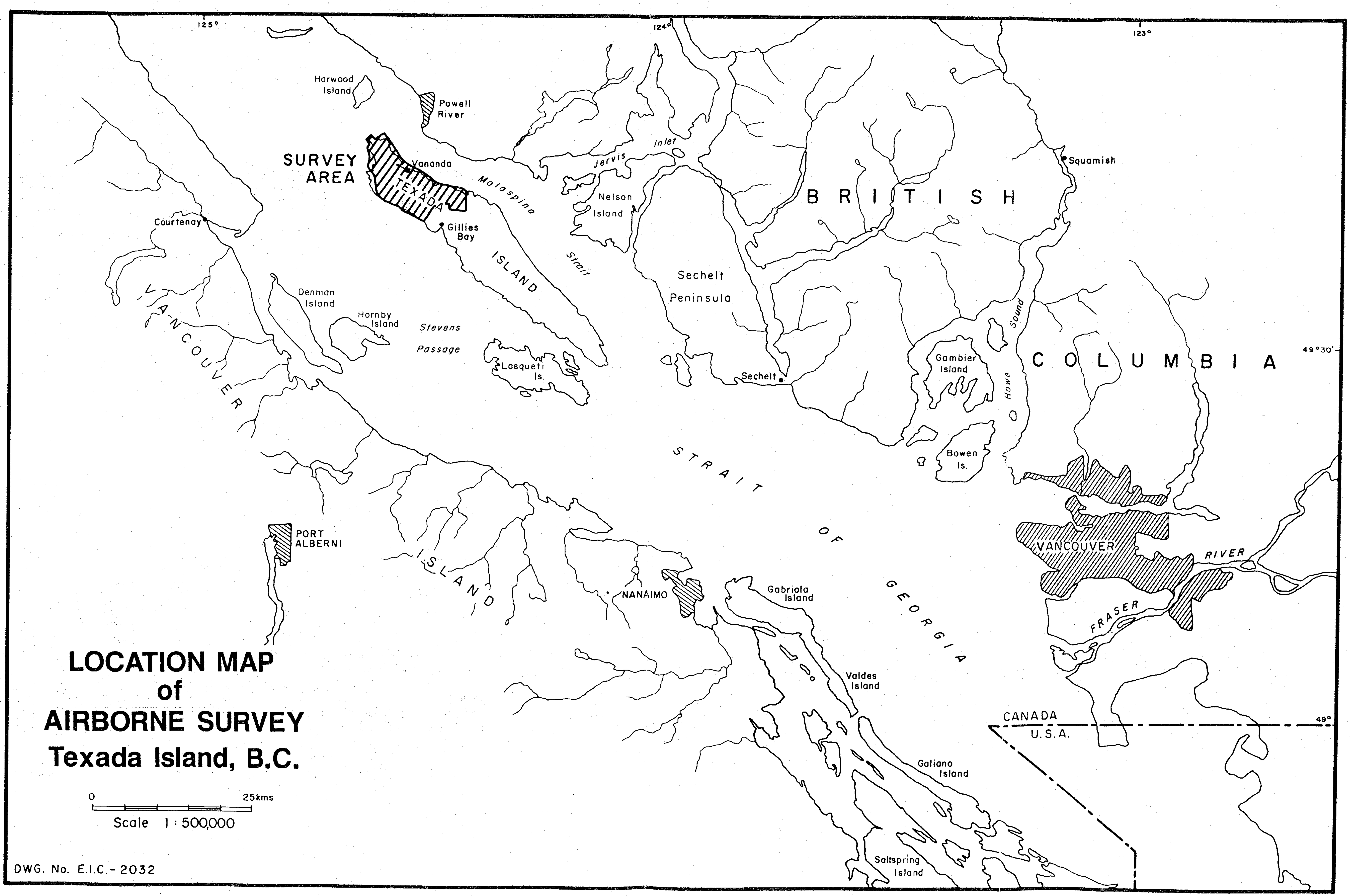
EB-3	Skarn	Modest magnetic peaking 500 m S from hornblende diorite intrusion at coast. Strong suggestion it part of, or associated with same intrusion raking to the SE under limestone capping. Estimated depth of burial: 100 m. Ought to be investigated as part of EB-2 preceding.
EB-4	Skarn	Embraces the old Loyal showing which sits on shoulder of its own local magnetically high horn-blende diorite plug. Adjacent to mapped fault.
EB-5	Skarn	Analogous setting to EB-4. Diorite plug off-shore in this case. Small satellite magnetic high within locality as well as shoulder. Transected by NE fault.

EB-6	Skarn	Pronounced magnetic tongue at edge of major structural zone, also possibly at edge of buried intrusive sheet. Source shallow, < 50 m.
EB-7	Skarn	Another magnetic tongue, more modest but similar to EB-6 above, similar setting structurally. 7th locality to share the northern tip of the island which which potentially is underlain by one intrusive sheet to which local noted apophyses are connected in depth. Recommend that all these seven localities be investigated by the one comprehensive grid, lines 100 m apart extending from Blubber Bay road to coast, total 66 kms including 2 BLs.

EB-8	Skarn	On flank of separate magnetic closure evocative of buried plug, estimated depth: 225 m. Locality centred on NW tongue sticking out into sea at Limestone Bay.
EB-9	Skarn	Plateau of magnetic high, potentially representing shoulder to buried diorite intrusion. In limestone domain flanked by major regional structure.
EB-10	Skarn	Incorporates a magnetic protuberance SW from a closure suggestive of a buried plug. Limestone thickness estimated: 225 m. Sits astride a major structural intersection. Proximal to volcanic contact.
EB-11	Skarn	Lies in saddle of magnetic ridge distinguished by long tongue longitudinally disposed. Close

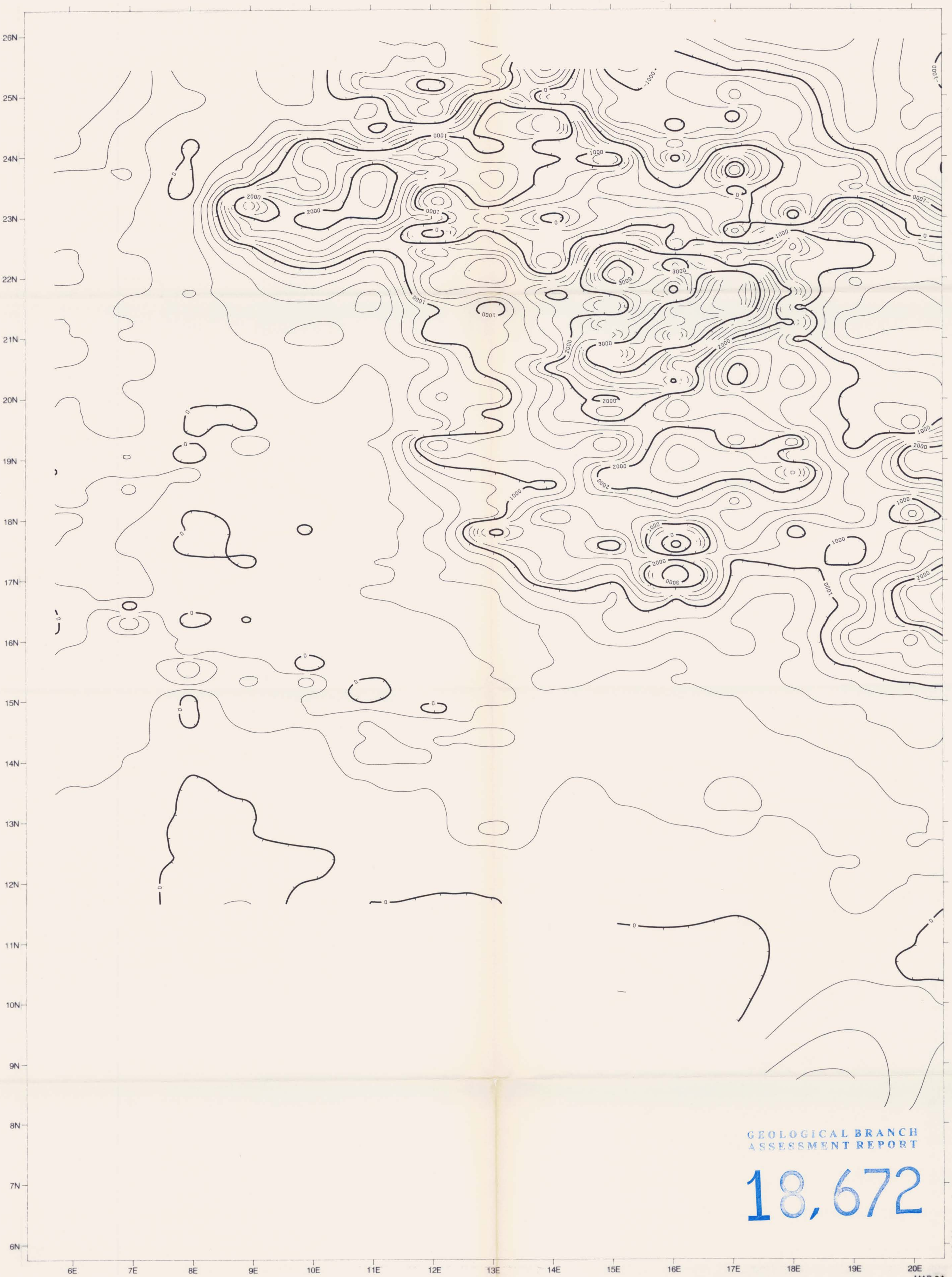
		to major structure and presumed underlain by intrusion.
EB-12	Skarn	Focuses on magnetic high in location where limestones are mapped. Likely due to intrusion in part, possibly to volcanics. Major structure in vicinity.
EB-13	Skarn	Local magnetic peaking at nose of evident diorite plug. At or on volcanic/limestone contact. Cross-stucture likely in vicinity.
EB-14	Skarn	Low-order individually peaking magnetic high close to Marble Bay Fault. N-S cross-structure emanating from Eagle Cove. Analogous setting to Marble Bay mine at Vananda, 2.5 kms along structural strike to SE.
EB-15	Skarn	Long magnetic extension SW of

		the hornblende diorite body underlying Yew deposit implicit. Adjacent to fault contact with limestones E end Priest Lake. Analogous setting to the Commodore prospect 2 kms to S.
EB-16	Vein	Unusual magnetic low. Made up of twin sinks, both perceptibly less resistive than surroundings. Centred on sector of structural interaction. Locates on flank of magnetic ridge potentially due to buried intrusion. Locality includes minor magnetic proturberance from same.
EB-17	Vein	Individual magnetic high in large body of high distinguished by being less resistive than neighbouring peaks. Intruded volcanic domain presumed. Considerable interlacing structure present. Akin to Golden Slipper setting.



LOCATION MAP of AIRBORNE SURVEY Texada Island, B.C.

DWG. No. E.I.C.- 2032



MAP 6A

ECHO BAY MINES LTD.

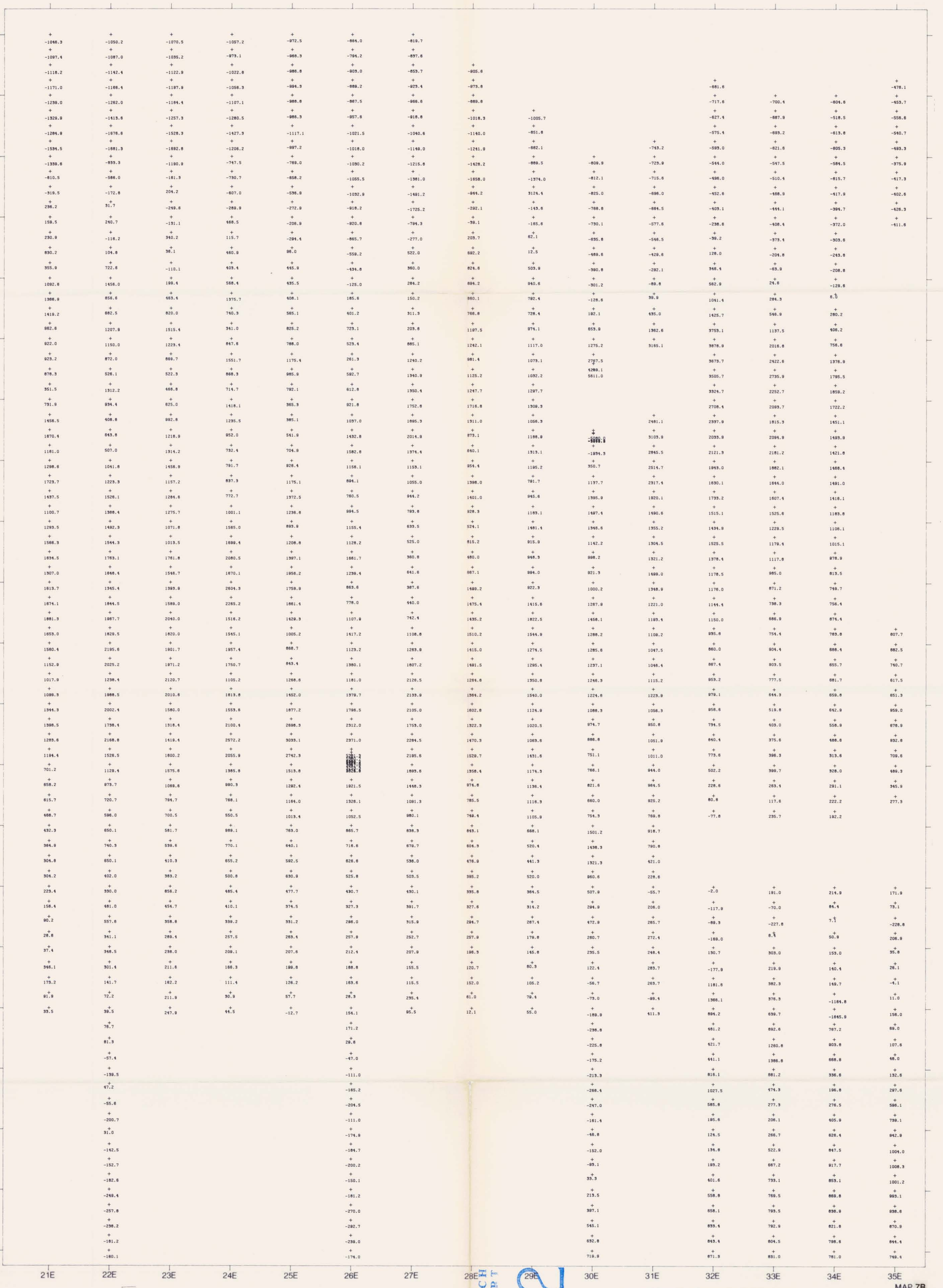
Suite 354 200 Granville Street Vancouver, B.C., Canada V6C 1S4

M21

TOTAL MAGNETOMETER SURVEY CONTOURS

DATUM 57,500 CONTOUR INTERVAL: 20nT

Geology by:	Date:	N.T.S.: 92F/15
Drawn by:	Scale: 1:1000	No.: SHEET 1



MAP 7B

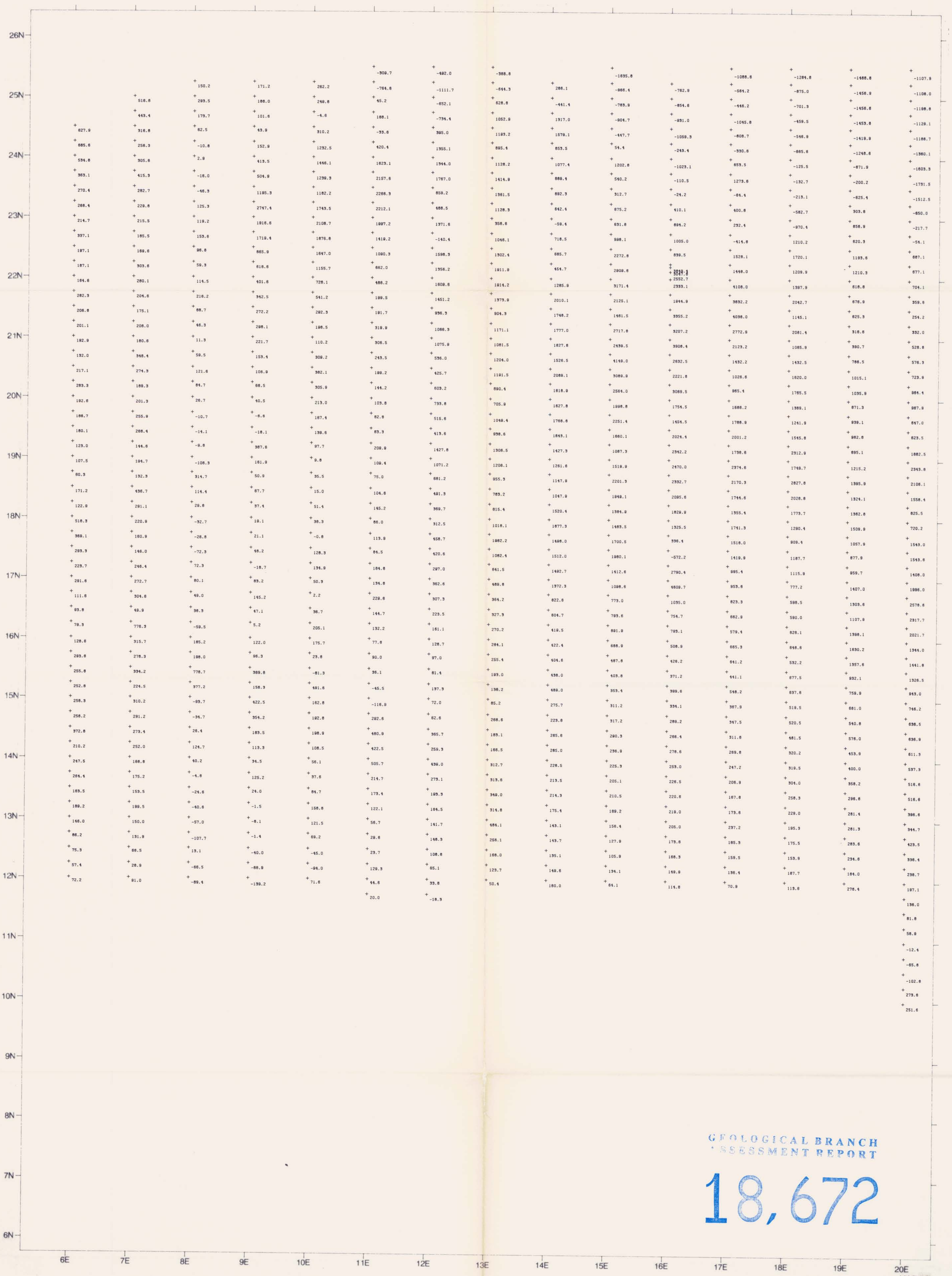
ECHO BAY MINES LTD.

Suite 354 200 Granville Street Vancouver, B.C., Canada V6C 1S4

M21

TOTAL MAGNETOMETER SURVEY POSTINGS

Geology by:	Date:	N.T.S.: 92F/15
Drawn by:	Scale: 1:1000	No.: SHEET 2



MAP 7A

ECHO BAY MINES LTD.

Suite 354 200 Granville Street Vancouver, B.C., Canada V6C 1S4

M21

TOTAL MAGNETOMETER SURVEY POSTINGS

Geology by:	Date:	N.T.S.: 92F/15
Drawn by:	Scale: 1:1000	No.: SHEET 1

MAP 6B

ECHO BAY MINES LTD.

Suite 354 200 Granville Street Vancouver, B.C., Canada V6C 1S4

M21

TOTAL MAGNETOMETER SURVEY CONTOURS

DATUM 57,500 CONTOUR INTERVAL: 20nT

Geology by:	Date:	N.T.S.: 92F/15
Drawn by:	Scale: 1:1000	No.: SHEET 2

MAP 6C

ECHO BAY MINES LTD.

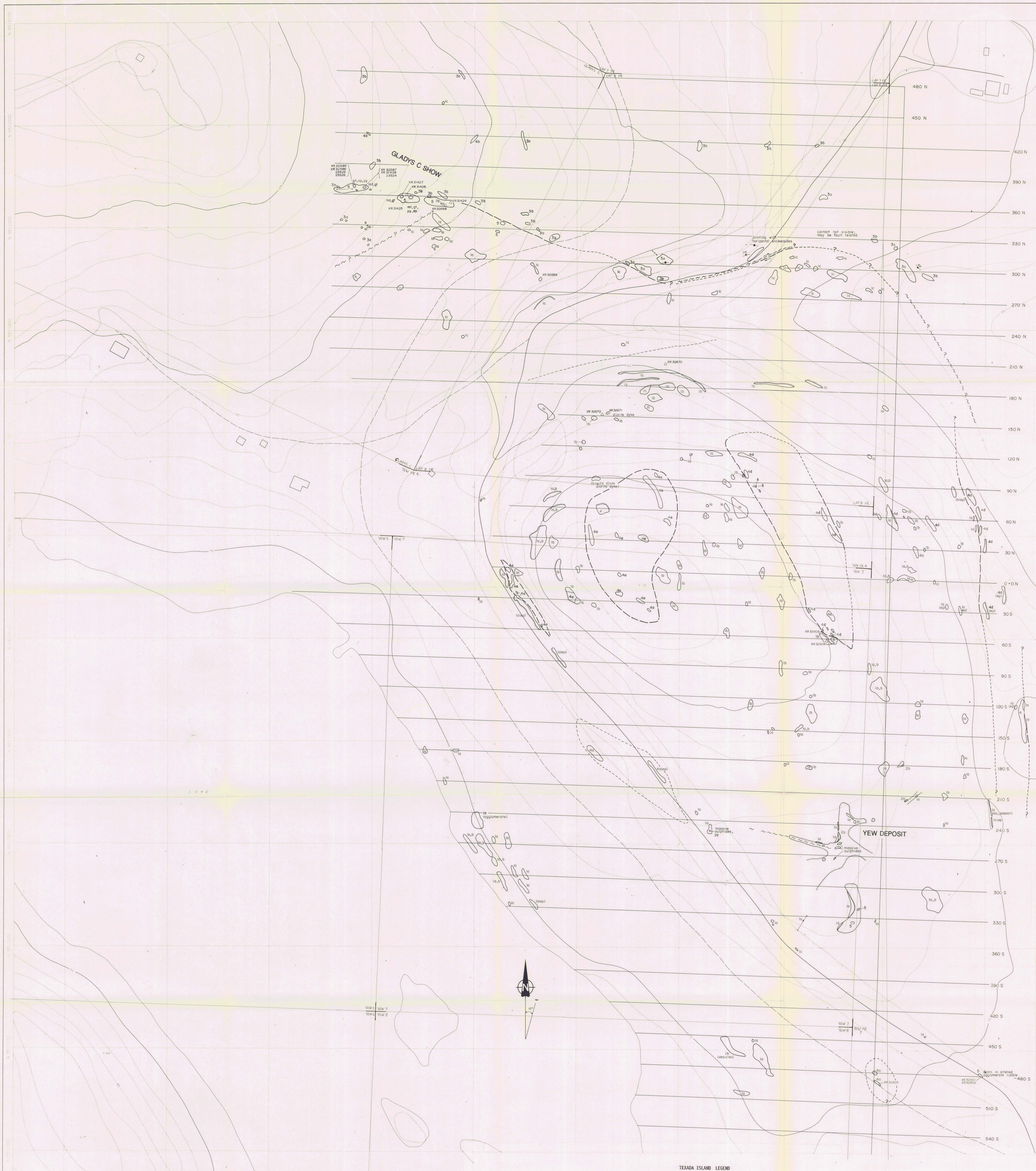
Suite 354 200 Granville Street Vancouver, B.C., Canada V6C 1S4

M21

TOTAL MAGNETOMETER SURVEY CONTOURS

DATUM 57,500 CONTOUR INTERVAL: 20nT

Geology by:	Date:	N.T.S.: 92F/15
Drawn by:	Scale: 1:1000	No.: SHEET 3



TEXADA ISLAND LEGEND

ISLAND INTRUSIVES (MIDDLE-UPPER JURASSIC)

- 4a Hornblende (Quartz) Diorite
- 4b Grandiorite
- 4c Quartz monzonite
- 4d Andesite dykes (f.g. equivalent to la-locally hornblend porphyritic)
- 4e Dacite dykes
- 4f Quartz feldspar porphyry dyke (possible tertiary event)

VANCOUVER GROUP (UPPER TRIASSIC)

QUATSINO FORMATION

- 3a Fine grained microcrystalline limestone, black to grey fresh surface, weathers blue grey. Massive to thick bedded; in parts thinly bedded with shale and siltstone laminations.
- 3b Medium to coarse grained, white to medium grey, recrystallized marble

KARMUTSEN FORMATION (Upper Triassic)

- 2a Intraformational limestone unit
- 1a Feldspar phyric basalt
- 1b Epidote - chlorite - calcite amygdaloidal basalt
- 1c Fine grained massive basalt (flow (?))
- 1d Pillowed basalt
- 1e Mafic tuff and/or agglomerate ($1e_t$-Tuff $1e_a$ - agglomerate)
- 1f Columnar jointed basalt (possible younger flow event)
- 1g Subvolcanic mafic intrusive

MINERALIZATION

SKARN MINERALIZATION

- 5a Magnetite-garnet skarn
- 5b Pyroxene-garnet skarn
- 5c Epidote-amphibole skarn

SYMBOLS

- Geological contact (defined, approximate, assumed)
- Fault (approximate, assumed)
- Fault (Dip unknown, known)
- Jointing (vertical, inclined)
- Outcrop
- Foliation (dip unknown, vertical, inclined)
- Adit
- Trench
- Pit
- Shaft
- XR32454 Rock grab sample
- XR31973 Rock channel sample
- Cliff

Sample No.	Gold gm/ton	Gold ppb	Silver ppm
XR31424		56	0.7
XR31425		2	0.1
XR31426		82	0.1
XR31427		26	0.1
XR31428		280	0.1
XR32585		395	0.7
XR32586	6.31	5280	0.6
XR32587		78	0.3
XR32668		138	0.1
XR32669		9	0.1
XR32670		38	0.3
XR32671		102	0.5
XR32672		52	0.2
XR32901		305	4.4
XR32902		46	0.1
XR32903		275	0.7
XR32904		28	0.2
XR32905		49	0.5

cb - carbonaceous
sil - silicification
ep - epidote
hem - hematite
qtz - quartz
py - pyrite
cpy - chalcopyrite
asp - arsenopyrite
gt - garnet
mt - magnetite

0 25 50 75 100 metres

BOLIVAR PROPERTY

MAP 3

ECHO BAY MINES LTD.
Suite 354 200 Granville Street Vancouver, B.C., Canada V6C 1S4

NORTH TEXADA YEW GRID

GEOLOGY & SAMPLING

Geology by: SH, PTS	Date: AUGUST 1988	N.T.S.: 92F/10E
Drawn by:	Scale: 1:1000	No.:

Contour Interval 5 metres

TEXADA ISLAND LEGEND

ISLAND INTRUSIVES (MIDDLE-UPPER JURASSIC)

- 4a Hornblende (Quartz) Diorite
- 4b Grandiorite
- 4c Quartz monzonite
- 4d Andesite dykes (f.g. equivalent to 1a-locally hornblend porphyritic
- 4e Dacite dykes
- 4f Quartz feldspar porphyry dyke (possible tertiary event)

VANCOUVER GROUP (UPPER TRIASSIC)

QUATSINO FORMATION

- 3a Fine grained microcrystalline limestone, black to grey fresh surface, weathers blue grey. Massive to thick bedded; in parts thinly bedded with shale and siltstone laminations.
- 3b Medium to coarse grained, white to medium grey, recrystallized marble

KARMUTSEN FORMATION (Upper Triassic)

- 2a Intraformational limestone unit
- 1a Feldspar phyric basalt
- 1b Epidote - chlorite - calcite amygdaloidal basalt
- 1c Fine grained massive basalt (flow (?))
- 1d Pillowed basalt
- 1e Mafic tuff and/or agglomerate ($1e_t$-Tuff $1e_a$ - agglomerate)
- 1f Columnar jointed basalt (possible younger flow event)
- 1g Subvolcanic mafic intrusive

MINERALIZATION

SKARN MINERALIZATION

- 5a Magnetite-garnet skarn
- 5b Pyroxene-garnet skarn
- 5c Epidote-amphibole skarn

SYMBOLS

- Geological contact (defined, approximate, assumed)
- Fault (approximate, assumed)
- Fault (Dip unknown, known)
- Jointing (vertical, inclined)
- 1a Outcrop
- Foliation (dip unknown, vertical, inclined)
- Adit
- Trench
- Pit
- Shaft
- XR32454 Rock grab sample
- XR31973 Rock channel sample
- Cliff

ELEMENT SAMPLES	Au gm/t	Au PPB	Ag PPM	As PPM	Cu PPM	Pb PPM	Zn PPM	Sb PPM	W PPM	Bi PPM	B PPM	Ni PPM	Co PPM
XR31851		260	19.8	29	10438	133	492	2	1	3	2	31	37
XR31852		14	0.5	29	287	5	101	2	1	2	3	5	17
XR31853		12	0.5	112	190	2	410	4	3	36	9	3	103
XR31854		18	0.6	135	381	2	112	4	1	2	19	4	193
XR31855		25	0.5	176	1052	3	226	2	9	38	2	3	68
XR31856	13.96	12370	13.2	49	13857	23	252	3	1	2280	3	6	58
XR31857		270	2.4	155	4982	2	153	2	1	72	2	2	33
XR31858		395	0.3	118	539	4	14150	2	1	4	6	1	150
XR31859		250	5.0	181	9052	4	20351	2	2	2	2	1	147
XR31860		58	2.9	53	339	7	136	2	1	2	2	2	17
XR31861	4.48	4290	63.9	248	2805	6	159	2	1	2	2	2	312
XR31862	10.02	9285	94.6	151	65173	2	460	2	1	46	2	1	691
XR31863		465	10.0	170	17635	2	39935	3	103	2	3	1	329
XR31864		520	31.0	77	44556	8	3263	2	14	2	2	27	248
XR31865		665	16.9	283	21728	7	49037	2	3	7	6	3	267
XR31947		1	0.5	17	378	4	320	3	3	2	13	8	10
XR31948		18	0.7	48	95	25	79	2	1	2	6	5	29
XR31949	1.61	1985	0.7	47	22	27	117	2	1	3	4	5	17
XR31950		28	0.4	13	65	2	63	2	1	2	4	7	14
XR31976		92	0.6	38	204	8	175	2	1	3	24	1	11
XR31977		356	30.8	89	43440	2	77221	2	4	49	6	1	162
XR31978		52	1.1	36	1396	2	4182	2	3	2	3	1	20
XR31979	2.37	3885	31.3	35	68045	5	2469	4	11	35	11	7	139
XR31980		44	0.3	43	99	8	83	4	1	2	3	6	16
XR31981	2.88	2740	46.0	6	99999	7	3322	3	1	54	3	2	250
XR31982		6	0.6	40	162	24	116	3	1	2	18	1	11
XR31983		10	0.6	42	336	39	170	2	2	2	13	6	12
XR31984		34	0.4	50	41	11	71	2	1	2	2	15	7
XR31985		68	2.1	45	2005	3	31987	3	1	2	5	1	79
XR31986	12.86	7825	22.8	501	32600	2	1864	2	1	6	2	14	245
XR31987		116	1.2	46	1952	9	409	2	2	2	4	4	35
XR31988		610	18.8	190	33217	7	7342	2	1	9	2	3	210
XR31989		1	0.1	19	81	25	157	2	1	2	8	3	10
XR31990		26	0.3	40	249	25	102	2	1	2	7	5	15
XR31991		18	0.5	47	364	10	49	2	2	2	6	1	36
XR31992		10	0.1	34	86	2	77	2	1	7	2	1	6
XR31993	15.94	14685	15.4	18	1246	2	70	2	1	2	5	1	295
XR31994		6	0.3	2	59	2	94	2	5	2	2	2	1
XR31995		14	0.4	71	69	25	168	2	1	2	3	6	6
XR31996		39	4.3	22	6420	17	553	2	1	2	6	5	24
XR31997		96	6.4	88	9153	17	773	2	40	39	2	4	76
XR31998		485	13.4	137	20187	17	43546	2	22	30	2	3	249
XR32043		24	0.3	25	155	2	64	2	1	2	17	7	16
XR32044		12	0.3	43	133	9	184	3	1	2	14	19	20
XR32045		40	2.5	113	3967	6	193	2	40	2	2	1	66
XR32046		620	26.3	163	47673	5	7074	2	7	18	4	3	261
XR32047		20	0.6	47	75	53	578	2	1	2	3	4	14
XR32048		56	0.5	16	314	11	105	2	1	4	2	6	18
XR32049		14	0.8	36	41	37	119	2	1	2	21	4	11
XR32050		6	0.2	32	60	5	43	3	3	3	3	9	13
XR32564	0.10		2.8	25	28	14	99999	2	4	104	10	1	757
XR32565	0.07		2.6	44	3731	7	27281	2	3	2	8	1	106
XR32566	0.24		8.0	62	15414	7	5049	2	56	2	2	1	50
XR32574		385	36.5	34	50677	11	99999	7	1	82	3	2	682
XR32575		79	2.3	50	6380	3	62502	2	4	3	3	2	300
XR32576		83	5	135	9499	8	99999	4	2	3	4	2	435

0 50 100 150 FEET

N.B.

This is an IMPERIAL grid. Grid indicators are in FEET.

MAP 4

ECHO BAY MINES LTD.

TITLE: **NORTH TEXADA PARIS MINE**
GEOLOGY & SAMPLING

GEOLOGY BY	DRAWN BY	SCALE
S. STAKIW, M. WASEL		1 : 500
N.T.S. 92F/10	DATE AUGUST 1988	DRAWING NO.

REVISED BY	DATE


TELEPHONE POLE
ROAD
THIS LINE HAS BEEN PRECISELY SURVEYED.
M-21 ZONE
VOLUNTEER ROAD SHOW
VOLUNTEER
Mt-Cu SHAFT
Mt-Cu SHAFT
CADET
GLADYS' C
LAP 7 FR.
GLADYS C
STURT BAY
GABRIOLA FR.
TEXADA
MAG 2
KEY FR.
CADET KEY FR.
VOLUNTEER ROAD SHOW
(previous sampling)
SAMPLE NUMBER | GOLD oz/ton | COMMENTS
23517 0.003
23518 0.010
23520 0.340
23521 0.130
23856 0.003 28+50E 14+00N
23871 0.047
23882 0.240
23883 0.006
23886 0.001
23887 0.001
34702E 0.300 1 foot chip
34703 0.020
VOLUNTEER Mt-Cu SHAFT
(previous sampling)
SAMPLE NUMBER | GOLD oz/ton | COMMENTS
23881 0.561
48701E 0.634
48702E 0.660
48703E 0.450 2 foot chip
CADET
(previous sampling)
SAMPLE NUMBER | GOLD oz/ton | COMMENTS
C34704 0.520 33E 12N
C34708 0.530 2 foot chip
T34709 0.174
23531 0.004 33E 12+60N
23532 0.347 33+25E 12+70N
23533 0.513 33+25E 12+70N
GLADY'S C
(previous sampling)
SAMPLE NUMBER | GOLD gm/tonne | COMMENTS
23522 0.080
23523 0.120
23524 0.150
23525 0.010
23526 2.420
M-21
(previous sampling)
SAMPLE NUMBER | GOLD gm/tonne | COMMENTS
23851 0.02 36E 12+50N
23852 0.01 36E 12+50N
23853 0.01 36E 14+00N
23854 0.58 32+50E 11+20N
23855 0.06 32E 12+00N
23857 0.03 12E 14+00N
23858 4.51 11+75E 15+50N
23859 23.00 11+40E 15+70N
23860 20.90 11+30N 15+60N
23861 2.20 9+25E 15+30N
23862 0.62 9+25E 15+30N
23863 0.70 8+80E 15+50N
23864 0.01 6E 13+00N
23865 0.01 6E 13+80N
23866 0.01 7E 14+85N
23867 0.26 Zn pit
23868 0.02 16E 16+25N
23869 0.02 16E 16+25N
23870 0.07 16E 18+00N
M-21 SAMPLE RESULTS (EBM GENERATED)
CADET SAMPLE RESULTS (EBM GENERATED)
GLADYS' C SAMPLE RESULTS (EBM GENERATED)
NOTE: CURRENT GRID INACCURATE - TO BE RESURVEYED.
TEXADA ISLAND LEGEND
ISLAND INTRUSIVES (Middle-Upper Jurassic)
4a Hornblende (Quartz) Diorite
4b Granodiorite
4c Quartz monzonite
4d Andesite dykes (f.g. equivalent to 1a-locally hornblend porphyritic
4e Dacite dykes
4f Quartz feldspar porphyry dyke (possible tertiary event)
VANCOUVER GROUP (Upper Triassic)
QUATSINO FORMATION
3a Fine grained microcrystalline limestone, black to grey fresh surface, weathers blue grey. Massive to thick bedded; in parts thinly bedded with shale and siltstone laminations.
3b Medium to coarse grained, white to medium grey, recrystallized marble
KARMUTSEN FORMATION (Upper Triassic)
2a Intraformational limestone unit
1a Feldspar phyric basalt
1b Epidote - chlorite - calcite amygdaloidal basalt
1c Fine grained massive basalt (flow (?))
1d Pillowed basalt
1e Mafic tuff and/or agglomerate
1f Columnar jointed basalt (possible younger flow event)
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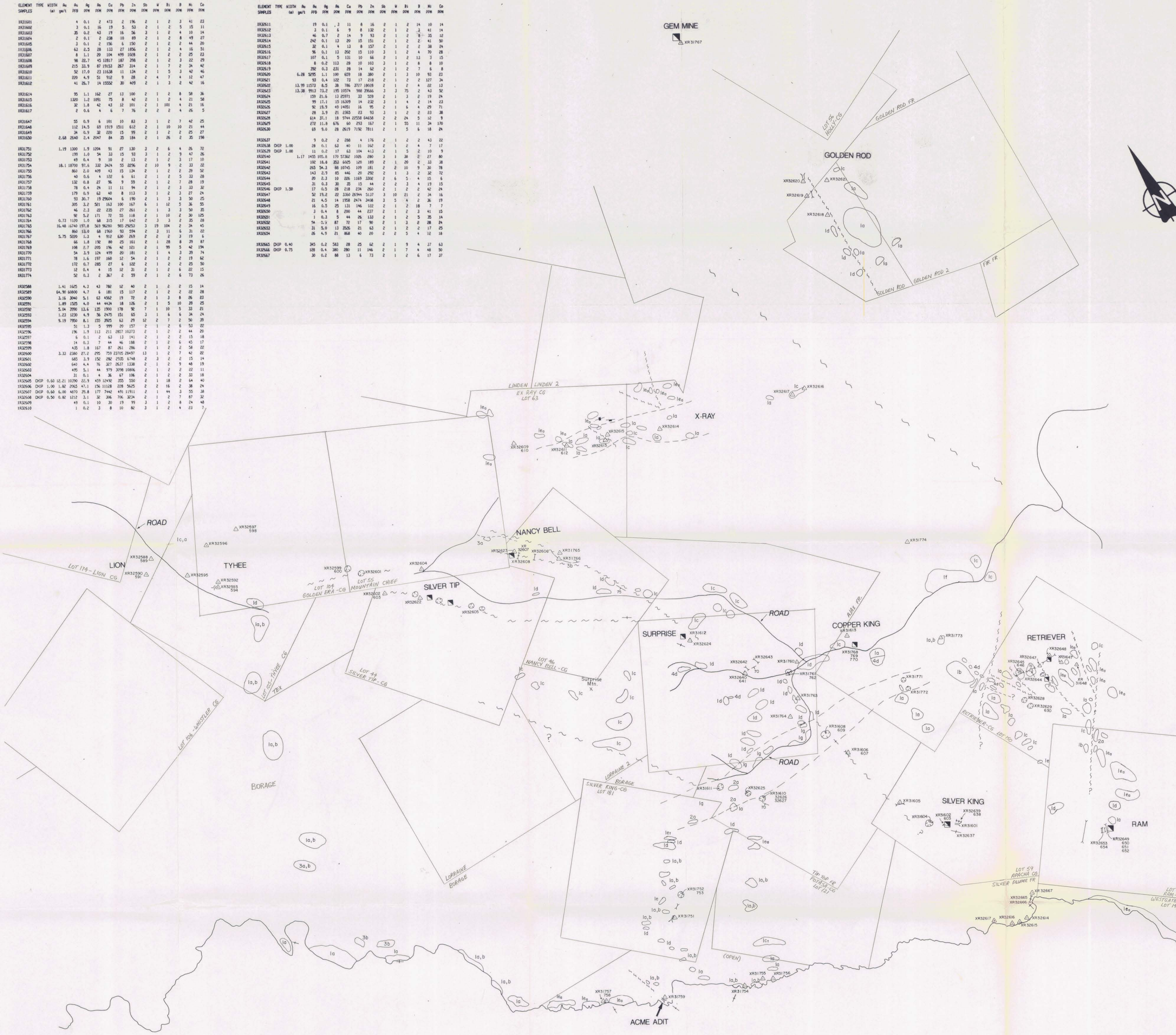
MINERALIZATION
SKARN MINERALIZATION
5a Magnetite-garnet skarn
5b Pyroxene-garnet skarn
5c Epidote-amphibole skarn
SYMBOLS
Geological contact (defined, approximate, assumed)
Fault (approximate, assumed)
Fault (Dip unknown, known)
Jointing (vertical, inclined)
Outcrop
Foliation (dip unknown, vertical, inclined)
Adit
Trench
Pit
Shaft
Rock grab sample
Rock channel sample
Cliff
GEOLOGICAL BRANCH
ASSESSMENT REPORT
18,672
MAP 2
ECHO BAY MINES LTD.
Suite 354 200 Granville Street Vancouver, B.C., Canada
NORTH TEXADA ISLAND
M-21 / CADET GRID
GEOLOGY & SAMPLE RESULTS
Geology by: PTS, JT
Drawn by:
Date: AUGUST 1988
Scale: 1:1000
N.T.S.: 92F/15

ELEMENT SAMPLES	TYPE	WIDTH (m)	Au gm/t	Au PPB	Ag PPM	As PPM	Cu PPM	Pb PPM	Zn PPM	Sb PPM	W PPM	Bi PPM	B PPM	Ni PPM	Co PPM
XR31601				4	0.1	2	473	2	196	2	1	2	3	41	23
XR31602				3	0.1	16	19	5	53	2	1	2	5	15	11
XR31603				35	0.2	43	19	16	56	3	1	2	4	10	14
XR31604				2	0.1	2	238	10	89	2	1	2	8	49	27
XR31605				3	0.1	2	156	6	150	2	1	2	2	44	20
XR31606				63	2.5	28	133	27	1856	2	1	2	4	16	51
XR31607				8	1.1	20	104	499	1028	2	1	2	2	25	23
XR31608				98	22.7	45	12817	187	398	2	1	2	3	22	29
XR31609				215	33.9	87	19153	267	314	2	1	7	2	34	42
XR31610				52	17.0	23	11638	11	134	2	1	5	3	42	46
XR31611				220	4.9	51	912	9	28	2	4	7	4	12	47
XR31612				41	26.7	14	15552	30	409	2	1	3	2	42	16
XR31614				95	1.1	162	27	13	100	2	1	2	8	58	36
XR31615				1320	1.2	1091	75	8	42	2	1	2	4	21	58
XR31616				32	1.8	42	43	12	101	2	1	101	4	21	16
XR31617				2	0.6	4	6	7	76	2	2	2	4	26	5
XR31647				55	0.9	6	101	10	83	3	1	2	7	42	25
XR31648				112	14.5	69	1919	1511	612	2	1	10	10	21	44
XR31649				34	0.9	32	220	15	99	2	1	2	2	25	27
XR31650			2.68	2640	2.4	2047	84	35	184	2	1	26	2	35	198
XR31751			1.19	1300	1.9	1204	91	27	130	3	2	6	4	26	72
XR31752				199	1.0	54	33	15	93	3	1	2	9	47	26
XR31753				49	0.4	9	10	2	13	2	1	2	3	17	10
XR31754			18.1	18700	97.6	332	3424	55	2296	2	10	9	2	33	22
XR31755				860	2.0	409	43	15	134	2	1	2	2	39	52
XR31756				40	0.6	4	122	6	61	2	1	2	5	33	28
XR31757				132	0.8	27	96	9	59	2	1	2	7	28	19
XR31758				78	0.4	24	11	11	94	2	1	2	3	33	32
XR31759				179	0.9	63	40	8	113	3	1	2	3	27	24
XR31760				93	30.7	19	29604	6	190	2	1	3	3	50	25
XR31761				305	3.2	521	163	100	167	6	1	12	5	36	55
XR31762				46	2.3	22	235	27	261	2	1	3	3	50	35
XR31763				92	5.2	171	72	55	118	2	1	10	2	30	125
XR31764			0.73	1120	1.0	68	315	17	642	2	3	3	2	35	28
XR31765			16.48	16740	197.8	569	96280	985	29253	3	19	104	2	34	45
XR31766				860	13.0	68	1960	93	594	2	3	11	6	31	22
XR31767			5.75	5220	1.3	4	912	630	269	2	2	2	3	19	6
XR31768				66	1.8	192	80	25	161	2	1	28	8	39	87
XR31769				108	2.7	205	196	42	121	2	1	99	5	42	194
XR31770				54	3.9	124	499	20	181	2	1	4	3	39	74
XR31771				78	1.6	197	160	12	54	2	1	2	2	19	62
XR31772				172	0.7	285	27	6	122	2	1	2	2	25	50
XR31773				12	0.4	4	15	12	31	2	1	2	6	22	15
XR31774				52	0.3	2	367	2	59	2	1	2	6	73	26
XR32588			1.41	1625	4.3	43	782	12	40	2	1	2	2	15	14
XR32589			64.90	60800	4.7	6	181	15	117	2	1	2	2	22	28
XR32590			3.16	3040	5.1	63	4562	19	72	2	1	3	8	26	23
XR32591			1.89	1525	4.0	44	4434	18	126	2	1	5	10	39	25
XR32592			5.04	3990	13.6	135	1900	178	92	7	1	10	5	33	21
XR32593			1.23	1230	4.9	56	2475	151	65	3	1	6	6	34	24
XR32594			9.19	7950	8.1	155	3925	63	29	12	2	7	2	50	39
XR32595				51	1.3	5	999	20	157	2	1	2	6	53	22
XR32596				196	1.9	113	211	2857	10373	2	1	2	2	44	20
XR32597				6	0.1	2	63	13	141	2	1	2	2	15	18
XR32598				14	0.3	7	44	46	188	2	1	2	6	45	17
XR32599				435	1.8	167	87	261	286	2	1	2	2	58	22
XR32600			3.33	2380	27.2	295	759	23705	28497	13	1	2	7	42	22
XR32601				685	3.9	152	282	2935	6748	2	3	2	2	15	14
XR32602				640	4.4	76	327	2637	1338	2	1	2	9	48	19
XR32603				495	5.1	44	979	3098	10806	2	1	2	2	22	11
XR32604				31	0.1	4	36	67	106	2	1	2	2	33	18
XR32605	CHIP	0.60	12.21	10390	22.9	459	12492	355	550	2	1	18	2	64	40
XR32606	CHIP	1.00	1.82	2065	47.1	156	11128	228	5625	2	2	16	2	38	24
XR32607	CHIP	0.60	6.00	4870	39.8	177	7442	491	11911	2	1	44	3	55	38
XR32608	CHIP	0.50	0.82	1212	3.1	32	306	706	3234	2	1	2	7	87	32
XR32609				49	0.1	10	30	19	99	3	1	2	8	24	48
XR32610				1	0.2	3	8	10	82	3	1	2	4	23	7

ELEMENT SAMPLES	TYPE	WIDTH (m)	Au gm/t	Au PPB	Ag PPM	As PPM	Cu PPM	Pb PPM	Zn PPM	Sb PPM	W PPM	Bi PPM	B PPM	Ni PPM	Co PPM
XR32611				19	0.1	3	11	8	16	2	1	2	14	10	14
XR32612				3	0.1	6	9	8	132	2	1	2	3	41	14
XR32613				46	0.7	2	14	9	93	2	1	2	8	35	12
XR32614				242	0.1	13	20	15	151	2	1	2	2	41	50
XR32615				32	0.1	4	13	8	157	2	1	2	2	38	24
XR32616				96	0.1	13	202	15	110	3	1	2	4	70	28
XR32617				107	0.1	5	131	10	66	2	1	2	13	3	15
XR32618				8	0.2	113	28	10	103	3	1	2	8	8	10
XR32619				392	0.3	231	28	14	62	2	1	2	7	6	8
XR32620			6.28	5295	1.1	100	659	18	380	2	1	3	10	93	23
XR32621				93	0.4	122	73	17	218	2	1	2	2	127	34
XR32622			13.99	11573	8.5	38	786	3727	18028	2	1	2	4	22	13
XR32623			13.38	9913	73.2	195	10574	988	39666	3	3	75	2	43	52
XR32624				159	21.6	13	25971	33	559	2	1	3	2	19	24
XR32625				99	17.1	15	16309	14	232	3	1	4	2	14	23
XR32626				92	19.9	49	14051	16	95	2	1	6	4	29	71
XR32627				28	3.9	21	2365	23	93	3	1	2	2	23	38
XR32628				614	37.1	18	9744	22558	64658	2	2	24	5	12	9
XR32629				272	11.8	676	60	293	167	2	1	55	11	34	170
XR32630				69	9.0	28	2619	7192	7811	2	1	5	6	18	24
XR32637				9	0.2	2	288	4	176	2	1	2	2	43	22
XR32638	CHIP	1.00		28	0.1	63	40	11	162	2	1	2	4	7	17
XR32639	CHIP	1.00		11	0.2	17	63	104	413	2	1	5	2	10	9
XR32640			1.17	1455	105.8	170	57362	1026	280	3	1	38	2	27	80
XR32641				102	18.8	353	6025	120	189	2	1	20	2	33	38
XR32642				265	54.3	88	10745	109	181	2	2	10	9	30	78
XR32643				143	2.9	85	446	20	292	2	1	3	2	32	72
XR32644				20	2.3	10	226	1169	3302	2	6	5	4	15	6
XR32645				31	0.3	30	35	15	44	2	2	3	4	19	15
XR32646	CHIP	1.50		17	0.5	28	218	234	260	2	1	2	2	42	24
XR32647				52	19.2	22	3360	26944	5137	3	10	21	2	34	16
XR32648				21	4.5	14	1958	2474	3408	3	5	4	2	36	19
XR32649				16	0.5	25	131	146	122	2	1	2	18	7	7
XR32650				3	0.4	8	200	44	237	2	1	2	3	41	15
XR32651				1	0.3	5	44	26	133	2	1	2	5	35	14
XR32652				54	0.9	87	72	17	90	2	1	3	2	28	24
XR32653				31	5.0	13	3526	21	63	2	1	2	2	17	25
XR32654				26	4.9	21	868	40	20	2	2	5	4	12	18
XR32665	CHIP	0.40		345	0.2	583	28	25	62	2	1	9	4	37	63
XR32666	CHIP	0.75		128	0.4	380	280	11	146	2	1	7	4	48	50
XR32667				30	0.2	88	13	6	73	2	1	2	6	17	37



TEXADA ISLAND LEGEND

ISLAND INTRUSIVES (MIDDLE-UPPER JURASSIC)

- 4a Hornblende (Quartz) Diorite
- 4b Grandiorite
- 4c Quartz monzonite
- 4d Andesite dykes (f.g. equivalent to 1a-locally hornblend porphyritic
- 4e Dacite dykes
- 4f Quartz feldspar porphyry dyke (possible tertiary event)

VANCOUVER GROUP (UPPER TRIASSIC)

QUATSINO FORMATION

- 3a Fine grained microcrystalline limestone, black to grey fresh surface, weathers blue grey. Massive to thick bedded; in parts thinly bedded with shale and siltstone laminations.
- 3b Medium to coarse grained, white to medium grey, recrystallized marble

KARMUTSEN FORMATION (Upper Triassic)

- 2a Intraformational limestone unit
- 1a Feldspar phyric basalt
- 1b Epidote - chlorite calcite amygdaloidal basalt
- 1c Fine grained massive basalt (flow (?))
- 1d Pillowed basalt
- 1e Mafic tuff and/or agglomerate ($1e_t$-Tuff $1e_a$ - agglomerate)
- 1f Columnar jointed basalt (possible younger flow event)
- 1g Subvolcanic mafic intrusive

MINERALIZATION

SKARN MINERALIZATION

- 5a Magnetite-garnet skarn
- 5b Pyroxene-garnet skarn
- 5c Epidote-amphibole skarn

SYMBOLS

- Geological contact (defined, approximate, assumed)
- Fault (approximate, assumed)
- Fault (Dip unknown, known)
- Jointing (vertical, inclined)
- 1a Outcrop
- Foliation (dip unknown, vertical, inclined)
- Adit
- Trench
- Pit
- Shaft
- XR30454 Rock grab sample
- XR31973 Rock channel sample
- Cliff

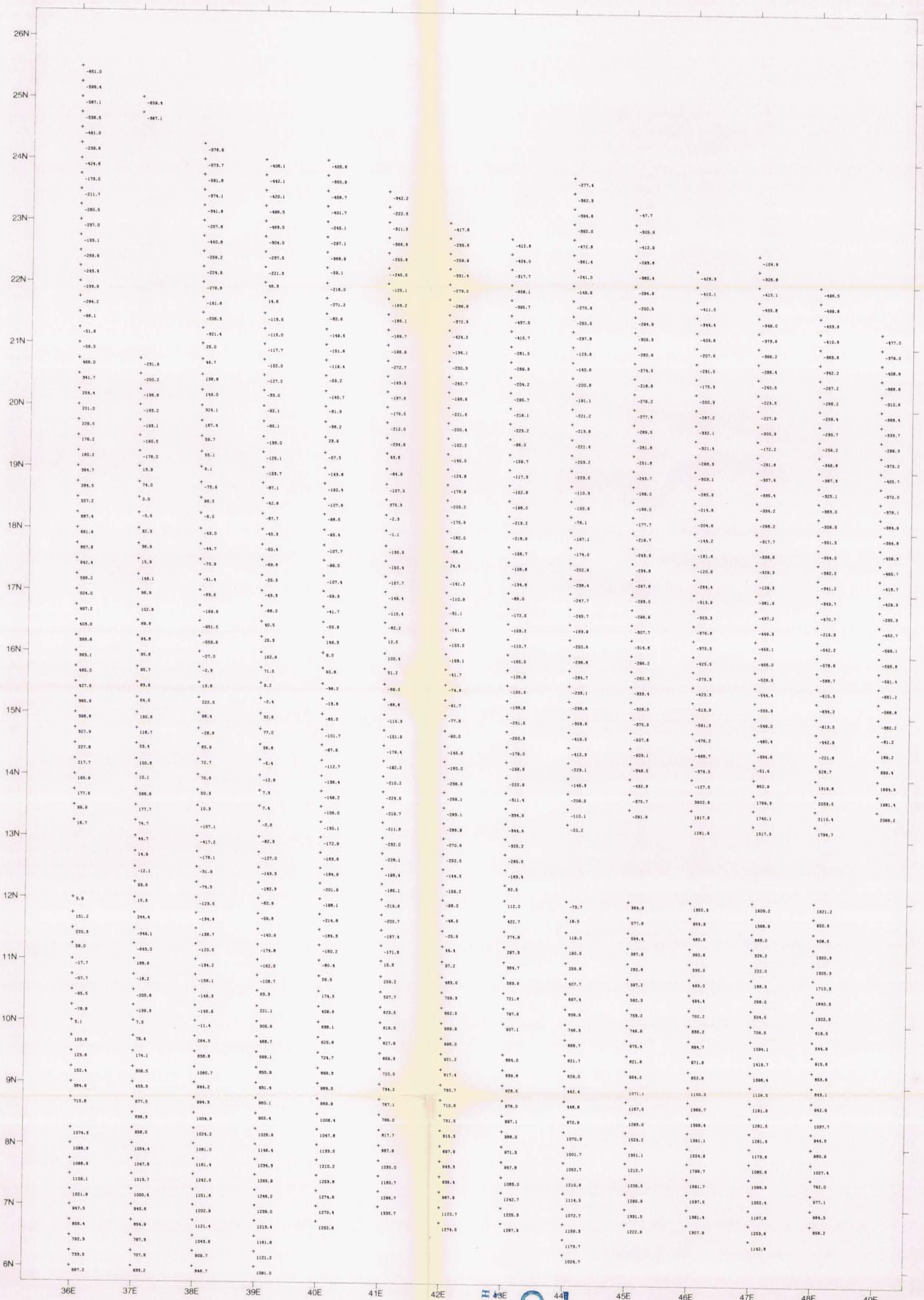
MAP 5

ECHO BAY MINES LTD.

TITLE	NORTH TEXADA ISLAND - SURPRISE MOUNTAIN AREA GEOLOGY & SAMPLING
GEOLOGY BY	BS, EF, PTS
DRAWN BY	
SCALE	1:5000
N.T.S.	92F/15
DATE	AUGUST 1988
DRAWING NO.	
REVISED BY	
DATE	

MAP 1

SIMPLIFIED GEOLOGY



MAP 7C

ECHO BAY MINES LTD.

Suite 354 200 Granville Street Vancouver, B.C., Canada V6C 1S4

M21

TOTAL MAGNETOMETER SURVEY POSTINGS

Geology by:	Date:	N.T.S.: 92F/15
Drawn by:	Scale: 1:1000	No.: SHEET 3