MPH

826355
92F/2

REPORT ON PHASE I GEOLOGY, SOIL GEOCHEMISTRY SURVEY, INDUCED POLARIZATION SURVEY AND DIAMOND DRILLING

EMMA PROPERTY
(Emma, Emma 1 to 22, Su 1 to 3 Claims)
Victoria, Nanaimo Mining Divisions
NTS 92F/2, 49°10'N Lat., 124°35'W Long.

for
AU RESOURCES LTD.

February 29, 1988

G.R. Cope, B.Sc.

VOLUME 1 OF 4

SUMMARY

Surveys conducted on the Emma property (Emma, Emma 1 to 22, Su 1 to 3 claims) during the 1987-88 field season include detailed geological mapping and rock sampling, a soil geochemistry survey and induced polarization surveys. A total of 1511 m (4960') of diamond drilling (12 drill holes) was carried out to test a number of the anomalies outlined by the various surface surveys.

Five areas of significant mineralization and gold enrichment were identified in the course of fieldwork.

The Peak Lake zone is characterized by widespread pyrite and pyrrhotite mineralization in volcaniclastic rocks of the Sicker Group. Pyritic dacite has intruded the volcaniclastic rocks and is the likely source of the pyrite-pyrrhotite mineralization.

Alteration within the Peak Lake zone varies from quartz-epidote flooding up to 500 m distal to the Peak Lake fault to pervasive carbonatization proximal to the fault, with abundant quartz veins to 25 cm wide present throughout. The quartz veins locally contain sphalerite and chalcopyrite in addition to pyrite.

Gold concentrations within the Peak Lake zone appear to increase with sphalerite content, and with proximity to the strong north-south trending Peak Lake fault which cuts the zone.

The zone is up to 600 m wide, extends south of Peak Lake and is open to the south. Within the zone there are a number of narrow linear zones of highly anomalous soil gold geochemistry as well as numerous linear geophysical anomalies.

The following table highlights significant drill intersections in the Peak Lake zone.

(m) FROM	(m) TO	(m) LGTH	(ppb) Au	(ppm) Ag	(ppm) Cu	(ppm) Zn	(ppm) OTHER

DDH - EM87-6 Target: Downdip extensions of gold-bearing quartz veins sampled at surface.

(m) FROM	(m) TO	(m) LGTH	(ppb) Au	(ppm) Ag	(ppm) Cu	(ppm) Zn	(ppm) OTHER
5.89	5.96	0.07	102	1.6	116	83	
10.00	10.05	0.05	405	7.2	411	247	
22.59	22.74	0.15	30	16.4 g/t (0.48 oz/T)	735	63	
29.15	29.27	0.12	200	76.4 g/t (2.23 oz/T)	228	1249	419 Pb
40.84	40.94	0.10	54	18.5 g/t (0.54 oz/T)	53	164	236 Pb
46.35	46.49	0.14	0.53 g/t (0.015 oz/T)	20.0 g/t (0.58 oz/T)	343	1001	380 Pb
49.60	49.76	0.16	156	37.9 g/t (1.11 oz/T)	166	191	501 Pb
64.97	65.04	0.07	17.8 g/t (0.519 oz/T)	316.0 g/t (9.22 oz/T)	0.263%	0.96%	2658 Pb
65.14	64.29	0.15	19	4.6	128	0.43%	1807 Pb
65.29	65.37	0.08	22	5.0	153	0.31%	3629 Pb

DDH - EM87-7 Target: Downdip extensions of gold-bearing quartz veins sampled at surface.

(m) FROM	(m) TO	(m) LGTH	(ppb) Au	(ppm) Ag	(ppm) Cu	(ppm) Zn	(ppm) OTHER
6.58	6.78	0.20	2.80 g/t (0.082 oz/T)	34.0 g/t (0.99 oz/T)	675	295	
19.98	20.03	0.05	157	5.3	0.758%	228	
34.40	34.52	0.12	62	114.5 g/t (3.34 oz/T)	339	532	786 Pb
62.59	62.67	0.08	208	4.9	368	156	
79.40	79.96	0.56	24	1.5	94	0.34%	
81.02	81.21	0.19	182	6.5	132	75	

DDH - EM87-10 Target: Induced polarization anomaly.

(m) FROM	(m) TO	(m) LGTH	(ppb) Au	(ppm) Ag	(ppm) Cu	(ppm) Zn	(ppm) OTHER
8.38	8.55	0.17	145	1.5	17	125	

DDH - EM87-11 Target: Coincident soil gold geochemistry anomaly and induced polarization anomaly.

(m) FROM	(m) TO	(m) LGTH	(ppb) Au	(ppm) Ag	(ppm) Cu	(ppm) Zn	(ppm) OTHER
127.73	127.80	0.07	48	1.9	0.252%	106	227 Ni
147.82	147.87	0.05	118	16.8 g/t (0.49 oz/T)	548	0.69%	

(m) FROM	(m) TO	(m) LGTH	(ppb) Au	(ppm) Ag	(ppm) Cu	(ppm) Zn	(ppm) OTHER
DDH - EM87-12 Target: Soil gold geochemistry anomaly.							
7.87	8.65	0.78	110	1.2	224	107	
20.53	20.65	0.12	292	10.3 g/t (0.30 oz/T)	0.850%	0.60%	
36.20	36.32	0.12	44	38.0 g/t (1.11 oz/T)	1.315%	605	711 As
38.69	38.90	0.21	90	58.3 g/t (1.70 oz/T)	0.429%	4.37%	1616.8 Cd, 585 Pb, 840 As
39.12	39.39	0.27	148	2.6	666	1058	
39.97	40.12	0.15	240	53.7 g/t (1.57 oz/T)	0.570%	9.2%	455 As, 567 Pb, 3582.5 Cd
43.41	43.56	0.15	0.58 g/t (0.017 oz/T)	6.5	1051	1427	569 As
58.93	59.22	0.29	0.65 g/t (0.019 oz/T)	2.3	483	170	1466 As
87.17	87.72	0.55	375	6.6	630	302	
91.18	91.24	0.06	0.81 g/t (0.024 oz/T)	1.9	111	540	

The High Grade zone is named for a sphalerite-bearing quartz vein within a tightly folded sequence of cherty tuffs. Surface samples of the quartz vein yielded assays of up to 149.4 g/t Au (4.357 oz/T) and 115.2 g/t Ag (3.36 oz/T). The High Grade zone is characterized by tightly folded and fault-bounded volcaniclastic rocks with minor pillow basalt. Numerous quartz veins cut the volcaniclastic rocks and frequently yield anomalous values for gold upon geochemical analysis.

The High Grade zone is broadly defined as having an average width of 200 m and extending 700 m northeast of the High Grade vein and open to the southwest. In addition to the gold-bearing quartz veins mapped on the surface, a number of soil gold geochemistry and induced polarization anomalies were outlined within the zone.

The following table highlights the significant drill intersections in the High Grade zone.

(m) FROM	(m) TO	(m) LGTH	(ppb) Au	(ppm) Ag	(ppm) Cu	(ppm) Zn	(ppm) OTHER
DDH - EM87-1	Target:	Downdip-strike extension of High Grade vein.					
25.34	25.61	0.27	65	5.2	0.284%	95	
74.98	75.26	0.28	107	0.7	71	47	
103.23	103.28	0.05	1.40 g/t (0.041 oz/T)	4.1	335	0.54%	
107.67	107.74	0.07	65	2.1	0.355%	89	
DDH - EM87-2	Target:	Coincident anomalous soil gold geochemistry and induced polarization anomaly.					
73.87	73.97	0.10	25	5.9	0.363%	92	
77.30	77.43	0.13	1.18 g/t (0.034 oz/T)	22.3 g/t (0.65 oz/T)	410	111	
87.70	87.88	0.18	1.98 g/t (0.058 oz/T)	20.0	4320	64340	817 Pb
95.08	95.21	0.13	32	1.4	120	0.34%	
106.09	106.20	0.11	1.22 g/t (0.036 oz/T)	18.5 g/t (0.54 oz/T)	0.332%	124	
114.70	114.80	0.10	87	2.4	0.215%	3.73%	
115.06	115.20	0.14	112	1.1	774	0.32%	
DDH - EM87-3	Target:	Downdip-strike extension of High Grade vein.					
56.08	56.16	0.08	2.31 g/t (0.067 oz/T)	4.3	457	90	
DDH - EM87-5	Target:	Downdip extension of gold-bearing quartz veins sampled at surface, anomalous soil gold geochemistry, induced polarization anomaly.					
33.51	33.66	0.15	123	5.0	420	98	
34.82	34.89	0.07	3.28 g/t (0.096 oz/T)	1.1	81	43	
38.39	38.49	0.10	560	3.0	871	36	
39.19	39.39	0.20	370	0.8	36	47	

The Debeaux Creek, Kammat Creek and CM-240 zones were examined at a reconnaissance scale. It was determined that the potential exists in these zones to host a structurally controlled, vein deposit similar to that of the neighbouring Debbie property. These zones are characterized by intense carbonatization of mafic volcaniclastic rocks related to north to northeast trending faults which transect the property. Gold-enrichment was indicated by rock sampling in each of the zones.

Of particular interest in the Debeaux Creek zone is a body of gabbro which has intruded along the Debeaux Creek fault. Later stage movement along the fault combined with hydrothermal processes has altered portions of the gabbro to magnetite-rich serpentinite with associated nickel-bearing sulphide mineralization. The zone of serpentinization is up to 300 m wide with an undetermined strike length. This zone bears certain similarities to a magmatogenic gold deposit in that gold is associated with nickel-sulphide segregations in ultramafic to mafic intrusions and as such, is a unique occurrence within the Sicker Group.

Based on the encouraging results of the 1987-88 field program, an aggressive follow-up program designed to further define the Peak Lake and High Grade zones and to examine the Debeaux Creek, Kammat Creek and CM-240 zones in detail is recommended. The recommended work program is estimated to require approximately $310,000 to complete.

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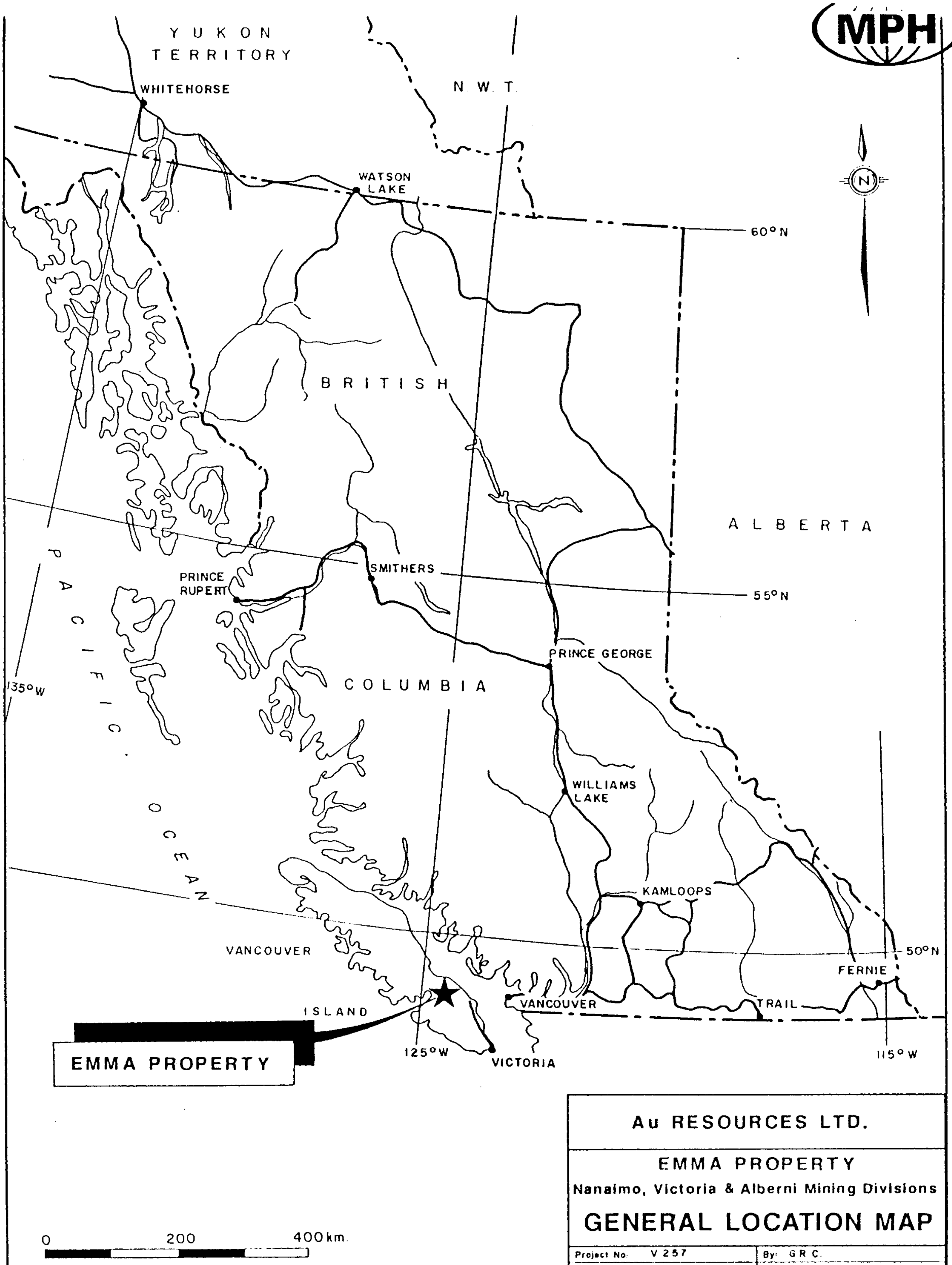


Au RESOURCES LTD.

EMMA PROPERTY

Nanaimo, Victoria & Alberni Mining Divisions

GENERAL LOCATION MAP

Project No: V 257	By: G.R.C.
Scale: 1 : 8 000 000	Drawn: G.R.C. / dw
Drawing No: 1	Date: FEB., 1988

MPH Consulting Limited

1.0 INTRODUCTION

This report details the 1987-88 mineral exploration program carried out by MPH Consulting Limited on the Emma property (Emma, Emma 1 to 22, Su 1 to 3 claims) at the request of Au Resources Ltd. of Burnaby, B.C. Geological fieldwork was performed during the period from June 25, 1987 to January 7, 1988 with report compilation taking place between January 7, 1988 and February 28, 1988.

Geological fieldwork included 1:10,000 and 1:2500 scale geological mapping, rock sampling (205 samples collected), stream sediment sampling (4 samples), soil geochemistry sampling (777 samples), induced polarization surveying (17.85 line-kilometres) and diamond drilling (1511 m in twelve holes).

The objectives of the program were to evaluate in some detail, the mineral potential of the east-central portion of the property and to explore the remainder of the property at a reconnaissance scale.

Included in this report is a summary of regional geology, a summary of mining exploration activity in the area and a description of the various surveys carried out on the property. A recommended exploration program designed to further explore the economic potential of the property is also included.

2.0 LOCATION, ACCESS, TITLE

The property is located on Vancouver Island, approximately 18 km southeast of Port Alberni, B.C. and lies within the Nanaimo and Victoria Mining Divisions. The property consists of the Emma claims (Emma and Emma 1 to 22) and the adjoining Su claims (Su 1 to 3) which lie astride McLaughlin Ridge and total 107 claim units. The Emma claims were grouped on September 25, 1987 (Notice to Group #1551) as the Emma Group and the Su claims were grouped on December 31, 1987 (notice to Group #1563) as the Su Group.

Access to the property is provided by MacMillan Bloedel's Cameron Main logging road. Within the property, exploration is greatly aided by the many secondary haulage roads and skidder trails installed during logging.

Claim ownership is summarized in the following table:

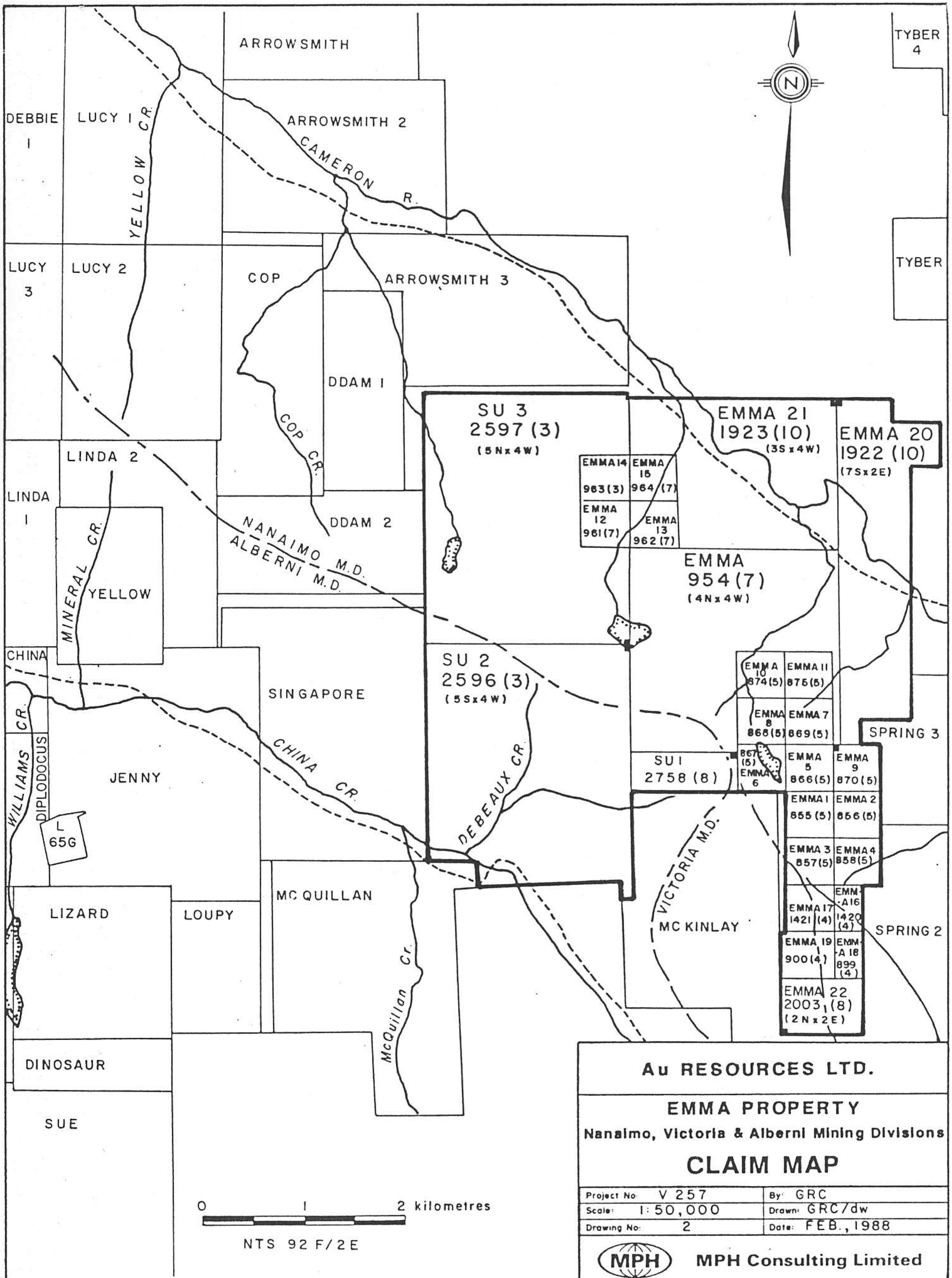
Table I

CLAIM OWNERSHIP

Claim	Record No.	Units	Owner	Expiry Date
Emma 1	855 (5)	1	R. Elander	May 6, 1990
Emma 2	856 (5)	1	K. Farrell	May 6, 1990
Emma 3	857 (5)	1	A. Farrell	May 6, 1990
Emma 4	858 (5)	1	A. Farrell	May 6, 1990
Emma 5	866 (5)	1	K. Farrell	May 19, 1990
Emma 6	867 (5)	1	A. Farrell	May 19, 1990
Emma 7	869 (5)	1	R. Elander	May 19, 1990
Emma 8	868 (5)	1	A. Farrell	May 19, 1990
Emma 9	870 (5)	1	R. Elander	May 19, 1990
Emma 10	874 (5)	1	R. Elander	May 26, 1990
Emma 11	875 (5)	1	K. Farrell	May 26, 1990
Emma 12	961 (7)	1	R. Elander	July 14, 1990
Emma 13	962 (7)	1	A. Farrell	July 14, 1990

Claim	Record No.	Units	Owner	Expiry Date
Emma 14	963 (7)	1	R. Elander	July 14, 1990
Emma 15	964 (7)	1	A. Farrell	July 14, 1990
Emma 16	1420 (4)	1	R. Elander	Apr. 25, 1990
Emma 17	1421 (4)	1	R. Elander	Apr. 25, 1990
Emma 18	899 (4)	1	R. Elander	Apr. 25, 1990
Emma 19	900 (4)	1	R. Elander	Apr. 25, 1990
Emma 20	1922(10)	14	Au Resources Ltd.	Oct. 1, 1989
Emma 21	1923(10)	12	Au Resources Ltd.	Oct. 1, 1989
Emma 22	2003 (8)	4	Au Resources Ltd.	Aug. 31 14 1990
Emma	954 (7)	16	K. Farrell	July 2, 1990
Su 1	2758 (8)	2	Au Resources Ltd.	Aug. 14, 1991
Su 2	2596 (3)	20	Farrell, Farrell Elander	Mar. 26, 1991
Su 3	2597 (3)	20	Farrell, Farrell Elander	Mar. 26, 1991

Note: Includes work filed this year.


ARROWSMITH
TYBER 4
DEBBIE 1
LUCY 1
YELLOW CR.
ARROWSMITH 2
CAMERON R.
LUCY 3
LUCY 2
COP
ARROWSMITH 3
TYBER
DDAM 1
COP CR.
SU 3
2597 (3)
(5N x 4W)
EMMA 21
1923 (10)
(3S x 4W)
EMMA 20
1922 (10)
(7S x 2E)
LINDA 2
EMMA 14
963 (3)
EMMA 15
964 (7)
EMMA 12
961 (7)
EMMA 13
962 (7)
LINDA 1
DDAM 2
NANAIMO M.D.
ALBERNI M.D.
MINERAL CR.
YELLOW
EMMA
954 (7)
(4N x 4W)
CHINA
SU 2
2596 (3)
(5S x 4W)
EMMA 10
874 (5)
EMMA 11
875 (5)
SINGAPORE
EMMA 8
868 (5)
EMMA 7
869 (5)
SPRING 3
WILLIAMS CR.
DIPLODOCUS
JENNY
CHINA CR.
DEBEAUX CR.
SU 1
2758 (8)
867 (5)
EMMA 6
EMMA 5
866 (5)
EMMA 9
870 (5)
EMMA 1
855 (5)
EMMA 2
856 (5)
L 65G
VICTORIA M.D.
EMMA 3
857 (5)
EMMA 4
858 (5)
LIZARD
LOUPY
MC QUILLAN
MC KINLAY
EMMA 17
1421 (4)
EMMA 16
1420 (4)
SPRING 2
EMMA 19
900 (4)
EMMA 18
899 (4)
McQuillan Cr.
EMMA 22
2003 (8)
(2N x 2E)
DINOSAUR
SUE
0
1
2 kilometres
NTS 92 F/2E
Au RESOURCES LTD.
EMMA PROPERTY
Nanaimo, Victoria & Alberni Mining Divisions
CLAIM MAP
Project No: V 257
By: GRC
Scale: 1:50,000
Drawn: GRC/dw
Drawing No: 2
Date: FEB., 1988
MPH
MPH Consulting Limited

3.0 PREVIOUS WORK

A previous report by R.W. Phendler (1983) summarizes the general history of the area. From 1860 to 1890 total placer mining on China Creek was reported to have exceeded $40,000. This led to extensive prospecting in the 1890's and the discoveries of several precious and base metal deposits, four of which occur south of China Creek.

The discovery of gold bearing quartz veins on Mineral Creek (7 km northwest of the Emma property) in 1895, led to the construction of an 8 stamp mill by the owners (Vancouver Island Gold Mines) in 1898.

A short decline was sunk on a quartz vein on the Emma 1 claim around the turn of the century.

In 1933, Vancouver Island Gold Mines resumed exploration on the Mineral Creek deposits and by 1936 constructed a 35 ton per day concentrator.

From 1933 to 1942 there were three additional lode discoveries south of China Creek due to increased activity spurred on by a rise in the price of gold ($20/oz to $35/oz).

A small quantity of gold was produced from the Havilah property (4 km south of the Emma property) over three years commencing 1936. The Havilah and Mineral Creek properties have a combined recorded production of 1565 tons averaging 12.3 g/t (0.36 oz/ton) Au and 30.5 g/t (0.89 oz/ton) Ag.

Approximately 4.5 km southwest of the Emma property the Thistle Mine produced 6867 tons averaging 13.4 g/t (0.39 oz/ton) Au, 8.2 g/t (0.24 oz/ton) Ag and 4.56% Cu from 1938 to 1942.

Bralorne Gold Mines and Pioneer Gold Mines were actively prospecting in an area about 1.4 km south of the Havilah property.

In 1962, Hunting Survey Corp. flew an airborne magnetic survey which covered the Emma property. From 1963 to 1966 regional mapping, silt sampling and prospecting were conducted by Gunnex Ltd. (Gunnex, 1966).

In 1979, Harlan Meade of Western Mines Ltd. examined and sampled several showings of sulphide bearing quartz veins on what is now the Emma claims. He recommended that no further work on the property be undertaken by Western Mines Ltd. (Meade, 1979).

Subsequently, the present owners discovered a narrow quartz vein with very high gold and silver concentrations.

In 1981, G. Sivertz of Prism Resources examined and sampled the showings on the property, concluding that there was little potential for a large tonnage deposit and recommending no further work. (Sivertz, 1981).

In 1982, the property was examined by G. Benvenuto of Westmin Resources Ltd. (Benvenuto, 1982). Based on three days of mapping and rock sampling, he noted that five mineralized, broadly folded bull quartz veins with a general northwest strike occur in the area east of Peak Lake. Mineralization includes pyrite and molybdenum in quartz veins; silver, copper and pyrite in quartz veins; gold, silver and pyrite in quartz veins; and the 'high grade zone' which contains gold, silver, sphalerite, chalcopyrite, galena and pyrite in quartz veins. The 'high grade zone' assayed up to 105 g/t (3.09 oz/ton) Au, 146 g/t (4.26 oz/ton) Ag, 0.365% Cu, 0.9% Pb, and 3.2% Zn from samples collected at 1 m intervals by Prism Resources. An ankerite altered basaltic shear zone sampled over 17 m perpendicular to the creek did not contain anomalous precious or base metal concentrations. Benvenuto recommended no further work by Westmin Resources due to there being too few veins of sufficient thickness and continuity to form an economic deposit on the property.

In May of 1983, Au Resources purchased a 79% interest in the Emma property from R. Elander, Kenneth and Alex Farrell with the remaining 21% held by the original owners.

In 1983, based on a one day property examination and the presence of a number of quartz veins, one of which yields significant gold values of 47.7 g/t (1.390 oz/ton) Au and 68.9 g/t (2.01 oz/ton) Ag, 16.7 g/t (0.487 oz/ton) Au and 41.1 g/t (1.20 oz/ton) Ag across 15 cm), R. Phendler recommended further work; an EM-Mag survey, geochemistry survey, trenching and stripping of veins, geological mapping and prospecting. (Phendler, 1983).

During 1984, under the direction of Mr. Phendler, a small grid was established over known areas of interest resulting in the collection of 759 soil samples, 13 silt samples, and 28 rock samples which were analyzed for gold and some for silver. Reconnaissance soil samples collected from road traverses totalled 230. Several anomalous zones were delineated within and outside of the grid.

In September of 1984, Phendler supervised follow up geochemical surveying (227 samples) on closely spaced lines extended some of these anomalies and outlined two new ones. Soil samples collected along logging roads at 50 m intervals outlined the R-20 (anomalous gold) zone in the northeast corner of the Emma property and the Kammat Creek Zone. Phase I VLF-EM, geochemistry and trenching were recommended, to be followed by Phase II diamond drilling at a combined cost of $125,000 (Phendler, 1985).

In 1985, T.E. Lisle was commissioned to conduct a geochemical survey along existing logging roads on the Emma 20 and Emma 21 claims to fulfill assessment requirements for Au Resources. A total of 207 samples was collected and assayed for gold and silver. Gold and silver concentrations ranged up to 80 ppb and 2.7 ppm respectively (Lisle, 1985).

In October 1985 a 12.5 line-km grid was surveyed by VLF-EM, and 'Fraser filtered' data was plotted at 1:2500. Four weak to moderate conductors were indicated, some of which were coincident with soil geochemical anomalies.

A magnetometer survey was conducted along 7.6 line-km of the grid using 'an older model fluxgate magnetometer'. Apparently this instrument was not 'sensitive' enough and only slightly higher than background readings were obtained (Lisle, 1986).

In late 1985, the discovery of the 900 zone on the nearby Debbie property (Westmin Resources Ltd./Nexus Resource Corporation) created a surge in exploration activity in and around the immediate area. The 900 zone is located 1.2 km south-southwest of the Mineral Creek zone. Extensive diamond drilling has led to extremely high gold concentrations over mineable widths (4.078 oz/ton Au over 47.1 feet (139.8 g/t Au over 14.36 m)) and hence the construction of a 1.9 km exploration adit is planned (Press Release, January 29, 1988) Westmin Resources. This adit will provide access to the Mineral Creek and Linda gold zones.

In February 1986, Lisle prepared a report on the Emma property summarizing previous work and recommending two phases of work (Lisle, 1986).

4.0 REGIONAL GEOLOGY, STRUCTURE AND ECONOMIC SETTING

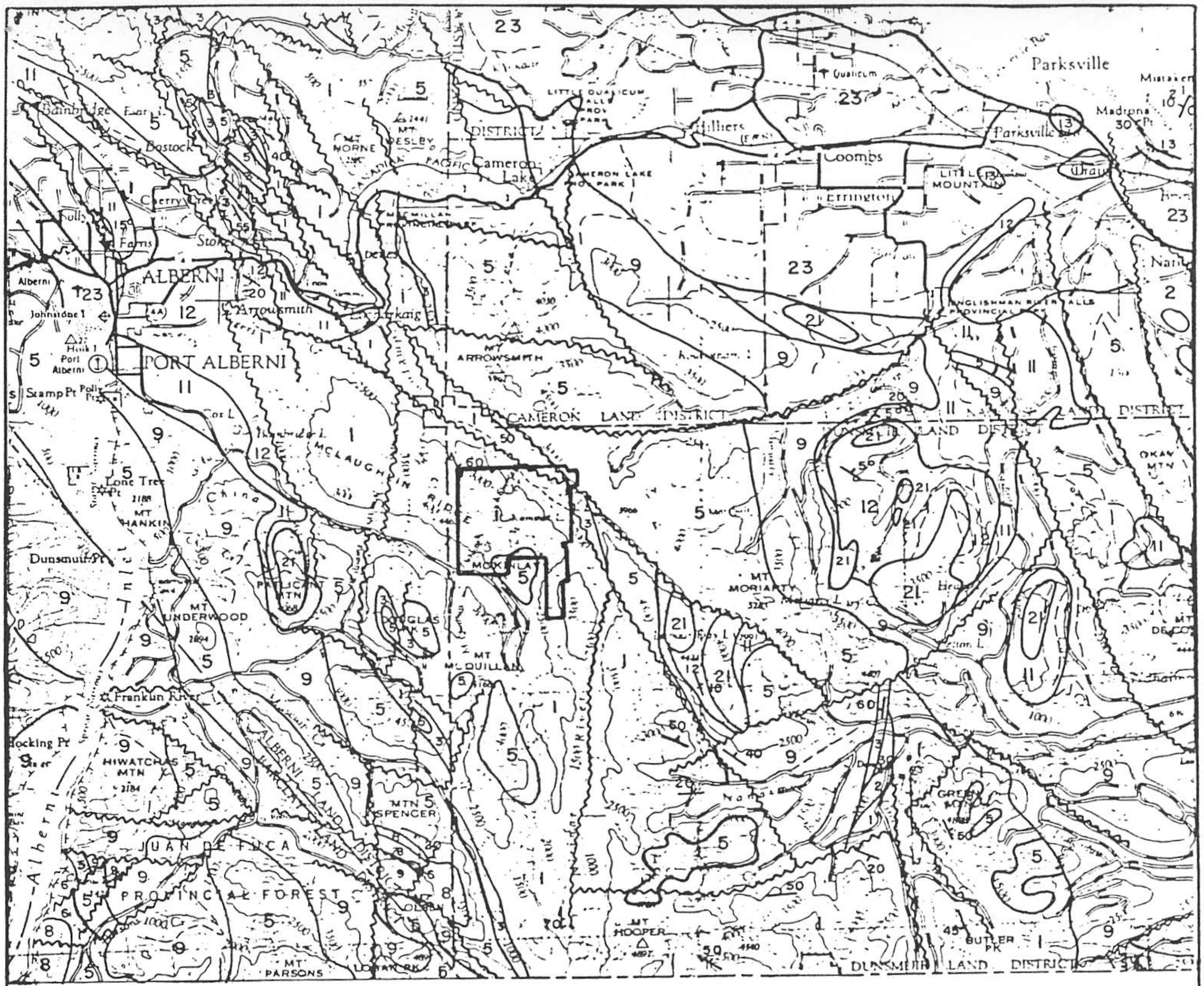
The predominant rock units in the Port Alberni - Nitinat River area are those of the Upper Paleozoic Sicker Group and the Mesozoic Vancouver Group.

Recent government geological mapping has been carried out over the Cowichan Lake area, by a number of geologists and compiled with previous work by J.T. Fyles, A. Sutherland Brown and P. Cowley (N.W.D. Massey, 1987). Massey uses the terminology introduced by Sutherland Brown (1986) and has proposed redivisions and renaming of the Sicker Group. However, Muller's terminology has been retained in this report due to the significance of the Myra Formation from an economic standpoint.

4.1 Sicker Group

Muller (1980a) proposed the following subdivision of the Sicker Group, from oldest to youngest: Nitinat Formation, Myra Formation, Sediment-Sill Unit, and Buttle Lake Formation.

The **Nitinat Formation** (Unit 1) consists predominantly of mafic volcanic rocks, most commonly flow-breccias or agglomerates including some massive flows, and rare pillow basalts. Locally, medium-grained, generally massive basaltic tuff is interbedded with the flows. The flow-breccia is composed of fragments of basalt up to 30 cm in length containing phenocrysts of uralitized pyroxene as well as amygdules, both from 1 mm to more than 1 cm in size, in a matrix of finer grained, similar basalt(?). Thin



LEGEND

QUATERNARY

23	Glacial and alluvial deposits

TERTIARY

21	Hornblende quartz diorite, leucoquartz monzonite, porphyritic dacite, breccia.

UPPER CRETACEOUS
NANAIMO GROUP

13	EXTENSION-PROTECTION FM.: sandstone, conglomerate, shale, coal.
12	HASLAM FM.: shale, siltstone, fine sandstone.
11	COMOX FM.: sandstone, conglomerate, shale, coal.

MIDDLE TO UPPER JURASSIC

9	ISLAND INTRUSIONS: biotite-hornblende granodiorite, quartz diorite.

LOWER JURASSIC

8	BONANZA GROUP: andesitic to latitic breccia, tuff, and lava; minor greywacke, argillite, and siltstone.

UPPER TRIASSIC
VANCOUVER GROUP

6	QUATSINO FM.: massive to thick bedded limestone, minor thin bedded limestone.
5	KARMUTSEN FM.: pillow-basalt and pillow breccia, massive basalt flows; minor tuff, volcanic breccia; Jasperoid tuff, breccia and conglomerate at base.

TRIASSIC OR PERMIAN

4	Gabbro, periodite, diabase.

LOWER PERMIAN TO PENNSYLVANIAN
SICKER GROUP.

3	BUTTLE LAKE FM.: limestone, chert.
2	MYRA FM.: lower unit; argillite, greywacke, conglomerate, tuff, minor limestone. Upper unit; rhyodacite to rhyolite tuff, lapilli tuff, breccia lesser siliceous siltstone, argillite, quartz porphyry and mafic flows.
1	NITINAT FM.: basaltic uralite porphyry, agglomerate, pillow lava; greenschist.

0 5 10 km

N

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EMMA PROPERTY

Nanaimo, Victoria & Alberni Mining Divisions

REGIONAL GEOLOGY MAP

Project No: V 257	By: G.R.C.
Scale: 1 : 250,000	Drawn: G.R.C. / dw
Drawing No: 3	Date: FEB. 1988

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sections show pale green amphibole (uralite) is replacing clinopyroxene. Uralitized gabbroic to dioritic rocks underlie and intrude the volcanics and are believed to represent feeder dykes, sills, and magma chambers to the volcanics. The Nitinat Formation may be distinguished from the similar Karmutsen Formation by the abundance of uralite phenocrysts, a usual lack of pillow basalts, lack of dallasite alteration between pillows (characteristic of the Karmutsen) locally pervasive foliation, and lower greenschist or higher metamorphic grade. However, in some areas the distinction is still difficult (in which case whole rock analyses may be useful).

The **Myra Formation** (Unit 2) overlies the Nitinat Formation, possibly with minor unconformity. In the Nitinat-Cameron River area the Myra Formation is made up of a lower massive to widely banded basaltic tuff and breccia unit, a middle thinly banded albite-trachyte tuff and argillite unit, and an upper thick-bedded, medium-grained albite-trachyte tuff and breccia unit. In the lower unit, crudely layered mottled maroon and green volcaniclastic greywacke, grit and breccia are succeeded by beds of massive, medium-grained dark tuff up to 20 m thick interlayered with thin bands of alternating light and dark, fine-grained tuff with local fine to coarse breccias containing fragments of Nitinat Formation volcanics. The middle unit comprises a sequence of thinly interbedded, light feldspathic tuff (albite trachyte or keratophyre composition) and dark marine argillite which has the appearance of a graded greywacke argillite turbidite sequence. In the upper part of the middle unit, sections of thickly bedded to massive black argillite occur. The upper unit contains fine and coarse crystal tuffs in layers up to 10 m thick with local rip-up clasts and slabs of argillite up to 1 m in length as well as synsedimentary breccias of light coloured volcanic and chert fragments in a matrix of black argillite.

The type locality of the Myra Formation is Myra Creek, at the south end of Buttle Lake. Here volcaniclastic rocks consisting dominantly of rhyodacitic or rhyolitic tuff, lapilli tuff, breccia, and some quartz porphyry and minor mafic flows and argillite (Upper Myra Formation) are host to Westmin Resources Ltd.'s Myra, Lynx, Price, and H-W massive sulphide (Cu-Zn-Pb-Au-Ag-Cd) deposits.

Muller (1980a) estimated the thickness of the Nitinat Formation at about 2000 m and that of the Myra Formation at 750 to 1000 m. Both the Nitinat and Myra Formations were dated as Devonian and/or older by Muller (1980a).

The **'Sediment-Sill Unit'** (Unit 3) (informal subdivision) is transitional between the Myra and Buttle Lake Formations. The upper and lower contacts are poorly defined. Thin bedded, turbidite-like, much silicified or cherty massive argillite and siltstone are interlayered with diabasic sills. The sediments show conspicuous dark and light banding on joint surfaces. The sills consist of a fine-grained, greenish black matrix containing feldspar phenoorysts up to more than 1 cm, commonly clustered in rosettes up to a few centimetres in diameter, producing a very distinctive "flower porphyry" appearance. Subophitic texture may also be visible in hand specimen. The sediments are dated as Mississippian in age whereas the sills are believed to represent feeders to Triassic Karmutsen volcanics.

The **Buttle Lake Formation** (Unit 4) consists of a basal green and maroon tuff and/or breccia overlain by coarse-grained crinoidal and calcarenitic limestone, fine-grained limestone with chert nodules and some dolomitic limestone. Lesser amounts of argillite, siltstone, greywacke, or chert may also be present.

The Buttle Lake Formation is up to 466 m thick. The age of the formation, on the basis of fossil dating, appears to be Middle Pennsylvanian, possibly as young as Early Permian (Muller, 1980a) This has been confirmed by recent dating work by Brandon and others (1986), including isotopic as well as conodont ages, which indicate that rocks of the Buttle Lake Formation are early Middle Pennsylvanian (Atokan) through Early Permian (probably Sakmarian) in age.

4.2 Vancouver Group

The **Karmutsen Formation** (Unit 5) volcanic rocks paraconformably overlie the Buttle Lake Formation limestone to form the base of the Vancouver Group. They are the thickest and most widespread rocks on Vancouver Island. The formation, consists mainly of dark grey to black, or dark green, tholeiitic pillow basalt, massive basalt, and pillow breccia. Flows are commonly aphanitic, and amygdaloidal. Pillow lavas generally occur toward the base of the section.

Conglomerate containing clasts of Sicker Group rocks and jasperoid tuff forms basal sections in the Nitinat-Horne Lake area to the northwest.

Karmutsen Formation rocks are generally relatively undeformed compared to Sicker Group rocks and are dated Upper Triassic and older.

Massive to thick bedded limestone of the **Quatsino Formation** (Unit 6) occurs south of Mt. Spencer. The limestone is black to dark grey and fine-grained to microcrystalline. Coarse-grained marble occurs in the vicinity of intrusive rocks. Most of the economic skarn deposits on Vancouver Island are hosted by Quatsino limestone. Thin bedded limestone also occurs in the formation. Fossils indicate an age of Upper Triassic (Muller and Carson, 1969).

The **Parsons Bay Formation** (Unit 7) overlies Quatsino limestone, or locally, Karmutsen volcanics. It is composed of interbedded calcareous black argillite, calcareous greywacke and sandy to shaly limestone. The Quatsino and Parsons Bay Formations are considered to represent near and offshore basin facies, respectively, in the quiescent Karmutsen rift archipelago (Muller, 1981).

4.3 Bonanza Group

The **Bonanza Group** (Unit 8) stratigraphy varies considerably, as it represents parts of several different eruptive centres of a volcanic arc. Basaltic, rhyolitic, and lesser andesitic and dacitic lava, tuff, and breccia with intercalated beds and sequences of marine argillite and greywacke make up the Bonanza Group. South of Mt. Spencer and south of Corrigan Creek, the Bonanza Group consists of light coloured andesite and latite breccia, tuff and flows with minor greywacke, argillite and siltstone. The Bonanza Volcanics are considered to be extrusive equivalents of the Island Intrusions and to be of Early Jurassic age.

4.4 Island Intrusions

Exposures of **Island Intrusions** (Unit 9) consisting mainly of quartz diorite and lesser blotite-hornblende granodiorite occur throughout the area and are assigned an age of Middle to Upper Jurassic. Intrusive contacts with Sicker and Bonanza Volcanics are characterized by transitional zones of gneissic rocks and migmatite although contacts with Karmutsen Formation volcanic rocks are sharp and well-defined. Skarn zones are reported at the contact of Island Intrusions with Quatsino Formation limestone and less abundantly with Buttle Lake Formation limestone.

4.5 Nanaimo Group

Upper Cretaceous Nanaimo Group sedimentary rocks occurring throughout the area overlie Paleozoic Sicker Group rocks with profound unconformity. Extensive exposures occur in the Chemainus and Cowichan River valleys. The formations present comprise the basal portions of the Nanaimo Group.

The **Comox Formation** (Unit 11) consists mainly of quartzo-feldspathic, cross-bedded beach facies sandstone and lesser conglomerate. Numerous intercalations of carbonaceous and fossiliferous shale and coal are characteristic.

The **Haslam Formation** (Unit 12) is a nearshore littoral depositional facies unit characterized by massive bedded fossiliferous sandy shale, siltstone and shaly sandstone.

Interbedded coarse clastic conglomerate, pebbly sandstone and arkosic sandstone of the **Extension-Protection Formation** (Unit 13) are beach and deltaic sands. Minor shale and coal are reported.

Tertiary (Catface or Sooke) Intrusions (Unit 21). Sills and stocks of mainly hornblende-quartz diorite and dacitic hornblende-feldspar porphyry plus lesser leucocratic quartz monzonite intrude Nanaimo Group sedimentary rocks and Sicker Group rocks in the area.

4.6 Structure

The Buttle Lake Arch, Cowichan-Horne Lake Arch and Nanoose Uplift are north-northwesterly trending axial uplifts and are believed to be among the oldest structural elements in south central Vancouver Island. Folding and uplift occurred before the late Cretaceous, and possibly before the Mesozoic (Muller and Carson, 1969), and more tilting, folding, and uplift occurred after the late Cretaceous. Sicker Group volcanic and sedimentary rocks occur at the cores of these uplifts.

Asymmetric southwest-verging, northwest-trending antiformal fold structures characterized by subvertical southwest limbs and moderately dipping northeast limbs are reported at Buttle Lake, in the Cameron-Nitinat River area, and north of Cowichan Lake. Well-developed foliation developed during metamorphism to chlorite-actinolite and chlorite-sericite schist in steep and overturned limbs of folds. Folding may have occurred prior to intrusion of Triassic(?) mafic sills along axial planar surfaces in folded Sediment-Sill Unit rocks. Evidence from K-Ar dating also suggests Jurassic folding. Buttle Lake Formation limestones are relatively undeformed in some places, although in others, as in the Chemainus River Canyon, they are highly deformed, along with other Sicker Group rocks (Brandon and others, 1986). Vancouver Group units are not as intensely folded; gentle monoclinal and domal structures have been mapped. However, Karmutsen Formation volcanic rocks locally conform to the attitude of underlying Myra and Buttle Lake Formations (Muller, 1980a).

Some early Mesozoic faulting occurred in the area prior to emplacement of Island Intrusions. Middle to Upper Jurassic intrusive activity (Island Intrusions) occurred along northwesterly trends.

Extensive west-northwest trending faulting occurred during the Tertiary and is best illustrated by large displacements of Nanaimo Group sediments in some areas, such as the north side of the Chemainus River valley, placing Sicker Group rocks above Nanaimo Group rocks. These faults have been traced for up to 100 km. Such structures may represent large scale underthrusting from the southwest, in a regime of long-term semi-continual northeast-southwest compression. Nanaimo Group sediments are tilted up to at least 60^{o} from paleohorizontal where they are overlying folded Sicker Group rocks with angular unconformity such as on the south side of the Chemainus River Valley. Minor late northeasterly trending tear-faults and block faults offset northwest-trending faults in the Cowichan Valley and Saltspring Island areas.

4.7 Economic Setting

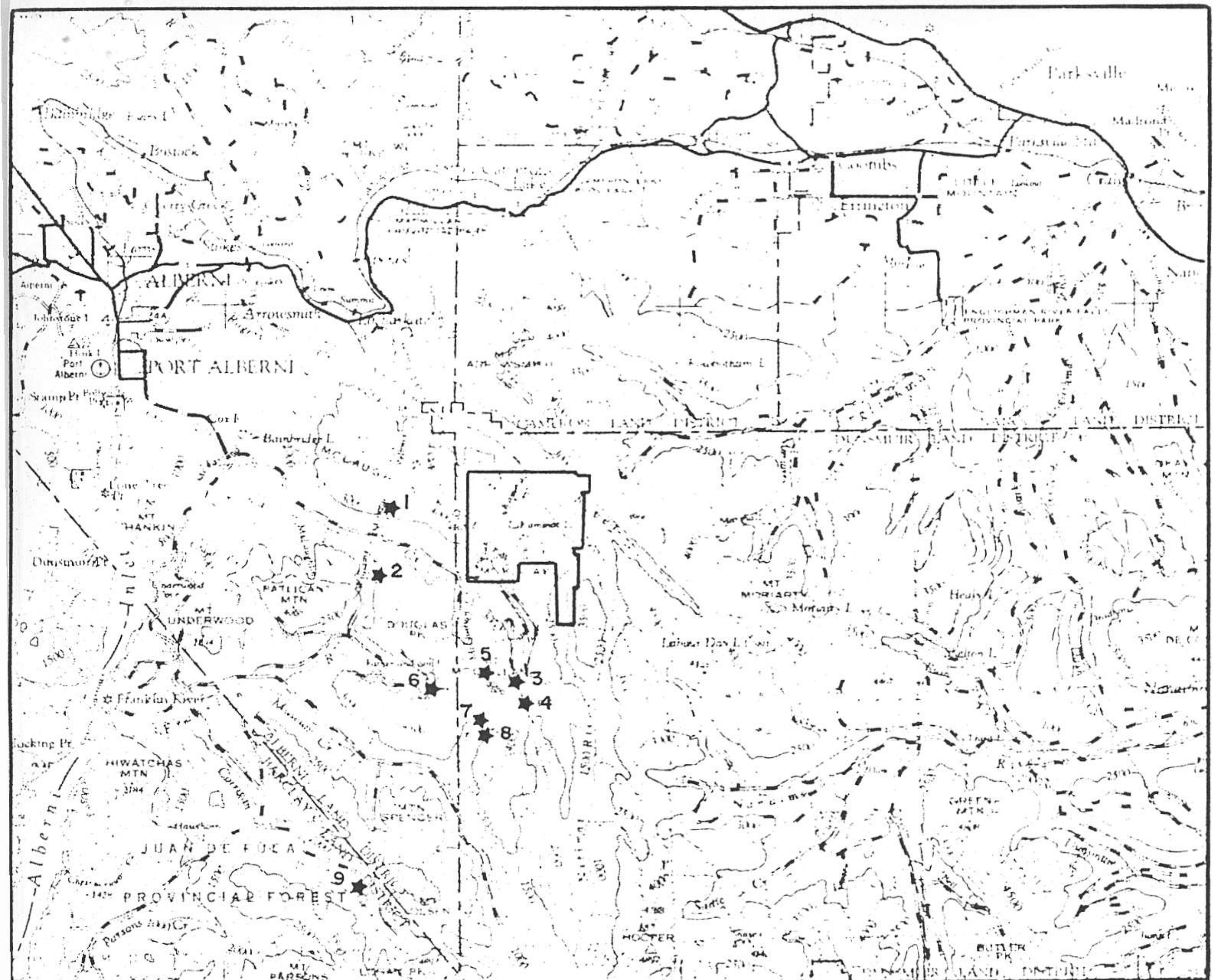
The Sicker Group, and to a lesser extent, the Vancouver Group of volcanics, have been explored intermittently since the 1890's for precious and base metal mineralization.

At Buttle Lake, the Myra Formation hosts Westmin Resources' volcanogenic massive sulphide deposit. Initially discovered in 1917, it was not recognized as a volcanogenic deposit until the late 1960's. Ore minerals including sphalerite, chalcopyrite, galena, tetrahedrite-tennantite, minor bornite and covellite are hosted by pyritic, rhyolitic to rhyodacitic volcanic and pyroclastic rocks of the Myra Formation.

Published reserves of the H-W mine are 13,901,000 tonnes averaging 2.2% Cu, 5.3% Zn, 0.3% Pb, 2.40 g/t (0.07 oz/ton) Au and 37.7 g/t (1.1 oz/ton) Ag (Walker, 1983). In the 3 years 1980 to 1982, 811,987 tonnes of ore were milled, producing 7,306,880 kg Cu, 43,706,118 kg Zn, 6,455,040 kg Pb, 1,740,000 g (56,000 oz) Au, 78,630,000 g (2,528,000 oz) Ag, and 58,500 kg Cd.

Another volcanogenic massive sulphide deposit in the Sicker Group is the Twin J Mine near Duncan on Mount Sicker. Two parallel orebodies, 46 m apart, each containing pyrite, chalcopyrite, sphalerite and minor galena in a barite quartz-calcite gangue and chalcopyrite in quartz, occur in schists believed to have been derived from acidic volcanics (Myra Formation).

Total production from 1898 to 1964 was 277,400 tonnes producing 1,383,803 g (44,491 oz) Au, 29,066,440 g (934,522 oz) Ag, 9,549,590 kg Cu and 20,803,750 kg Zn with at least 164,590 kg Pb and 4.5 kg Cd.



GOLD DEPOSITS AND OCCURRENCES

1. Vancouver Island Gold Mine
2. Regina
3. Golden Eagle
4. B & K
5. Havilah
6. Thistle
7. Black Panther
8. Black Lion
9. 3-W

0 5 10 km

N

Au Resources Ltd.

MINERAL OCCURRENCE LOCATION MAP

Project No: V 257	By: T.N.
Scale: 1 : 250,000	Drawn: J.S.
Drawing No: 4	Date: FEBRUARY 1988

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On the Lara property north of Cowichan Lake, Abermin Corp. has traced the polymetallic volcanogenic massive sulphide Coronation and Coronation Extension zones over a strike length of over 1500 m and to depths of 245 m. Average grades are 5.1 g/t Au, 111.4 g/t Ag, 0.81% Cu, 1.32% Pb, and 5.79% Zn over an average thickness of 3.9 m. A 162 m long high-grade zone within the Coronation zone averages 8.2 g/t (0.24 oz/ton) Au, 229.7 g/t (6.69 oz/ton) Ag, 1.5% Cu, 3.1% Pb, and 14.9% Zn over an average thickness of 3.4 m. Recent exploration has located other similar horizon(s) up to 2.4 km long parallel to the Coronation zone in the northern part of the property. The mineralized zones are hosted by felsic volcanics of the Myra Formation.

In a news release dated October 19, 1987, Abermin reported that work has commenced on a decline which will explore the Coronation zone, providing access to the ore zone on three levels. Future mining methods will be determined from testing of ground conditions. The mill design will be finalized following metallurgical testing of bulk samples.

This decline is expected to confirm the underground continuity and extent of the high-grade massive sulphide which has been traced by 8 diamond drill holes for a strike length of 160 m and an average thickness of 3.4 m. Weighted averages for the ore are: 8.16 g/t (0.238 oz/ton) Au, 230 g/t (6.71 oz/ton) Ag, 14.91% Zn, 3.07% Pb and 1.48% Cu.

In the Port Alberni area, five past producing mines occur. These include the Thistle mine, the Havilah mine, the Black Panther mine, the 3-W mine and Vancouver Island Gold Mine.

Vancouver Island Gold Mine is located on the Yellow claim adjacent to the Debbie property, 4 km west of the Emma property. Nexus Resource Corporation and Westmin Resources Ltd. are currently involved in an aggressive exploration program on the Debbie property and exciting new discoveries have yielded intersections of up to 4.25 g/t Au over 11.34 m (0.124 oz/ton Au over 37.2 feet) and 3.50 g/t Au over 18.20 m (0.102 oz/ton Au over 59.7 feet) from the Mineral Creek Zone and 139.82 g/t Au over 14.36 m (4.078 oz/ton Au over 47.1 feet) and 38.98 g/t Au over 13.50 m (1.137 oz/ton Au over 44.3 feet) from the 900 Zone. A 1.9 km exploration adit which will provide access to the Mineral Creek and Linda gold zones is planned (Westmin Resources News Release January 29, 1988).

5.0 PHASE I EXPLORATION PROGRAM

5.1 PHASE I, PROGRAM OUTLINE

The Phase I field exploration program on the Emma property was conducted between June 25, 1987 and January 7, 1988. Work performed consisted of geological mapping and rock sampling, silt sampling, a soil geochemistry survey, induced polarization surveys and diamond drilling.

A compassed and flagged grid was initially established over a strong north-trending fault structure located in the eastern portion of the property and identified by G.R. Cope and T.G. Hawkins of MPH Consulting Limited and past examiners as having significant mineral potential. A 1.5 km baseline was installed at a bearing of due north and east-west crosslines were run at 100 m line spacings to 600 m on either side of the baseline. Sample stations were established along the crosslines at 25 m intervals. While much of the grid is in open logging slash, a limited amount of linecutting was performed in areas of thick, immature growth. A total of 20.7 line-km of grid was established.

As the grid was being installed, a soil sample was collected at each sample station and subsequently analysed geochemically for gold and for 30 additional elements by inductively coupled plasma (ICP). Gold analyses were performed by Rossbacher Laboratory Ltd. of Burnaby, B.C. and ICP analyses were performed by Acme Analytical Laboratories of Vancouver, B.C. A total of 777 soils samples was collected. Results from the soil geochemistry survey are discussed in Section 5.3 and displayed in Figures 8 to 11.

Geological mapping and rock sampling included 1:10,000 scale mapping over the entire claim block with detailed 1:2500 scale mapping over approximately 42 km^2 northeast and southeast of Peak Lake. A total of 205 rock samples and 4 silt samples was collected and analysed geochemically for gold and for 30 additional elements by ICP. Samples strongly anomalous in one or more of gold, silver, copper and zinc were assayed to accurately determine metal content. Analyses were also performed by Rossbacher and Acme Analytical Laboratories. Rock sample descriptions and selected lithogeochemical concentrations are provided in Appendices I and III. Geology and mineralization are discussed in Section 5.2 and displayed in Figures 5 to 7.

A total of 17.85 line-km of induced polarized (IP) surveying was performed along roads and selected grid lines to the northeast and southeast of Peak Lake. Survey results are discussed in Section 5.4 and displayed in Figures 12 to 31. Equipment specifications and notes on IP/Resistivity methods are found in Appendix VIa and VIb respectively.

Upon completion of the various surface surveys, a program of diamond drilling was commenced to test the 'High Grade' zone northeast of Peak Lake and the Peak Lake zone southeast of Peak Lake. A total of 1512 m of drilling was completed in 12 holes by Burwash Enterprises Ltd. of Cobble Hill, B.C. Selected intervals of the drill core were split and samples sent to Min-En Laboratories Ltd. of North Vancouver, B.C. to be analysed geochemically for gold and for 31 additional elements by ICP. A total of 755 samples was collected from drill core. The drill core is stored at 9484 Lakeshore Drive in Port Alberni, B.C. Diamond drilling is discussed in Section 5.5 and drillhole sections displayed in Figures 32 to 41.

5.2 GEOLOGY, MINERALIZATION AND LITHOGEOCHEMISTRY

5.2.1 Lithologies
Upper Paleozoic Sicker Group

The oldest rocks exposed on the property belong to the Nitinat Formation (Unit 1a). Pyroxene-rich massive basalt flows, pillow lava and flow breccia with intra-flow exhalite packages are mapped along the west side of Kammat Creek and north of Henry Lake. The basalt flows are typically massive, dark green to grey-green, pyroxene-rich (phenocrysts partially altered to hornblende, up to 8 mm and comprising up to 60%) and moderately epidotized and carbonatized. Locally, pyroxene is entirely altered to apple green mica (fuchsite?). The pillow lavas consist of tightly packed, oblate, amygdaloidal pillows ranging from 10 cm up to 30 cm. Amygdules to 1 cm comprise up to 20% of individual pillows and are variously filled with quartz, calcite and chlorite. Pillow interiors are moderately altered to chlorite and epidote with black, glassy rims. Pillow interstices are extensively altered to hematite. Minor amounts of flow breccia were observed during mapping. The flow breccia consists of angular clasts of amygdaloidal basalt up to 8 cm and is variously chloritized, hematized and silicified. Exhalite packages were observed in roadcuts on the west side of Kammat Creek and north of Henry Lake. West of Kammat Creek, the exhalite package consists of an intra-flow unit of brick red, pyritic (much greater than 10% pyrite) jasper with minor black chert. This package is up to 3 m thick. North of Henry Lake, pyritic jasper and black chert mark the transition between flows and overlying volcanic sediments. This is one of the few contacts observed on the property which is not fault related.

Medium-grained, diabasic gabbro (Unit 1a) is mapped in the upper reaches of Debeaux and McKinlay Creeks and west of Kammat Lake. The gabbro appears to have intruded along northeast and north trending faults. In Debeaux and McKinlay Creeks, the gabbro is extensively altered to serpentine with local exposures of magnetite and/or ilmenite-rich serpentinite. This alteration to serpentine is probably related to renewed movement of the fault along which the gabbro has intruded.

Mappable contacts between Nitinat Formation lithologies and overlying Myra Formation lithologies are rarely observed on the property. For this reason, a transitional unit (Unit 2) is defined to cover lithologies of mixed origin. Unit 2 consists of intercalated, pyroxene porphyritic, basaltic andesite agglomerate, agglomeratic andesite lapilli tuff, medium-grained andesite tuff and minor cherty tuff. Unit 2 is exposed over the central western portion of the property. The agglomerate consists of 80% angular clasts to 20 cm and is clast supported. The clasts are predominantly (greater than 50%) pyroxene-porphyritic basalt with lesser amygdaloidal basalt and fine tuff. The matrix consists of fine tuff. The agglomeratic lapilli tuff is variously clast and matrix supported. Clasts range from 1 cm to 5 cm and include pyroxene-porphyritic basalt, amygdaloidal basalt and fine- to medium-grained tuff. The tuffs within Unit 2 are typically thick-bedded (greater than 10 cm) to massive, medium-grained andesite with lesser thin-bedded cherty tuff. The agglomerate and lapilli tuff are the most widely exposed lithologies within Unit 2.

Thin-bedded to massive, fine- to medium-grained andesite tuff and laminated to thin-bedded cherty tuff and chert (Unit 3) are exposed over the central portion of the property and are assigned to the Myra Formation. The tuffs invariably exhibit some degree of folding ranging from open to isoclinal and hence, bedding attitudes are extremely variable. In addition, the tuffs generally exhibit fault offsets at both an outcrop scale (tens centimetres) and a regional scale.

Aphyric pillow basalt (included in Unit 3) is exposed in one locality beside the Peak 200 road. Subrounded pillows to 1 m contain 20 to 30%, 5 mm to 1 cm calcite and quartz-epidote filled amygdules. Pillow interstices are also filled by quartz and epidote.

Unit 4, the Sediment-Sill Unit of Muller's classification (Reference 1977, 1980), is exposed immediately to the east of the Emma property. At this locality, it consists of interbedded chert, argillite and siltstone with characteristic ripup clasts of maroon and green chert. The sediments are intruded by several plagiophyric diabase sills up to 1 m in width.

Unit 5 directly overlies Unit 4 and corresponds with the Buttle Lake Formation. The Buttle Lake Formation consists of interbedded chert, siltstone, shale and crinoidal, bioclastic limestone.

Triassic Vancouver Group

The Karmutsen Formation (Unit 6) is exposed in the northeast corner of the property and consists of tholeiitic basalt pillow lavas and pillow breccia. Unit 6 is separated from the volcaniclastic rocks to the southwest by the northwest trending Cameron River Fault.

Cretaceous Nanaimo Group

The Comox Formation (Unit 7) is exposed in the northwest corner of the property and consists of poorly sorted, heterolithic boulder to pebble conglomerate with minor lenses of brown siltstone and shale. These sediments unconformably overlie the Sicker Group volcaniclastic rocks.

Tertiary(?) Intrusions

Numerous pale grey, feldspar ± quartz porphyritic dacite dykes are exposed on the property. The dykes vary in width from a few centimetres to several metres and individual dykes are traceable over hundreds of metres. Although the dykes are not observed crosscutting Cretaceous sediments, a Tertiary age has been assigned based on similarities to dykes related to the Catface Intrusions.

5.2.2 Structure

As noted previously, bedding attitudes on the property are extremely variable. Extensive folding and faulting has juxtaposed dissimilar lithologies and made geological correlations difficult. The dominant fault trends are north-south and northeast-southwest. The north-south faults tend to dip steeply to the east while the northeast-southwest faults tend to dip steeply to the northwest. Generally, the faults have developed a pervasive quartz-iron carbonate (listwanite) alteration envelope to within a few metres of the fault. Fuchsitic pseudomorphs after pyroxene phenocrysts are common within the alteration envelopes.

The dominant faults show up as sharp airphoto lineaments. The Peak Lake Fault is a strong lineament extending southwards from the Cameron River through the Nitinat River Valley. The Debeaux-Kammat Creek Fault extends southwest from the Cameron River along Kammat, Debeaux and McQuillan Creeks. Within Kammat Creek, right lateral movement is indicated by drag folds in thin-bedded cherty tuffs. The Cameron River fault is a northwest-southeast trending, northeast dipping regional structure extending from Horne Lake as far south as Maple Bay near Duncan, B.C.

5.2.3 Mineralization and Lithogeochemistry

Five zones of significant mineralization were outlined on the property consisting of the High Grade, Peak Lake, CM-240, Debeaux Creek, and Kammat Creek zones. The High Grade zone is centred 1 km north-northeast of Peak Lake and is characterized by abundant quartz and quartz-carbonate veins of which the High Grade vein is the most significant. The High Grade vein occurs within a tightly folded and faulted sequence of cherty tuffs. The vein was exposed by the Peak 200 roadcut and the exposure measures 4 m in the downdip direction, 1 m along strike and 10 cm in width with an orientation of 175/32E. A northwest trending fault truncates the vein downdip and to the south and the vein pinches out near the fold hinge in the updip direction. The vein consists of milky white quartz with up to 40% total sulphides. Sulphide minerals include sphalerite (up to 50%), pyrite (up to 50%) and chalcopyrite (up to 5%) with minor arsenopyrite. Grab samples from the vein have yielded the following results:

Sample No.	Au	Ag	Cu	Zn
16211	83.7g/t(2.440 oz/ton)	115.2g/t(3.36 oz/ton)	0.48%	5.56%
16211B	149.4g/t(4.358 oz/ton)	114.5g/t(3.34 oz/ton)	0.38%	5.08%
16215	25.6g/t(0.746 oz/ton)	71.3g/t(2.08 oz/ton)	0.58%	15.76%
16215B	24.5g/t(0.714 oz/ton)	63.1g/t(1.84 oz/ton)	1.00%	21.28%

In addition, a sample collected from the High Grade vein by Lornex Mining Corp. Ltd. in 1981 returned an assay of 1233.6 g/t gold (35.97 oz/ton).

A northwest trending, 2 cm wide, vuggy quartz vein with up to 50% pyrite is exposed 100 m northwest of the High Grade vein yielding analyses of 2.4 g/t Au and 8.5 ppm Ag (sample 16207). A float sample similar to and collected downslope from sample 16207 yielded analyses of 920 ppb Au and 10.2 ppm Ag (sample 16391). A 3 cm wide quartz vein with up to 20% pyrite, located 400 m north of the High Grade vein, returned analyses of 2.3 g/t Au and 2.2 ppm Ag (sample 16216). An additional 18 samples collected from veins within the High Grade zone yielded analyses greater than or equal to 20 ppb Au. The quartz veins are hosted by fine- to medium-grained tuffs and lapilli tuffs of the Myra Formation (Unit 3). Although typically well-mineralized with pyrite, samples collected from wallrock, with few exceptions, yielded background values upon geochemical analysis.

The Peak Lake zone is centred 700 m southeast of Peak Lake and is characterized by widespread pyrite and pyrrhotite mineralization with abundant pyritic quartz veins and numerous pyritic, feldspar porphyritic dacite dykes. The highest gold analyses are from samples of quartz veins located proximal to and oriented subparallel to the Peak Lake Fault.

These veins range in width from 2 cm to 15 cm and are generally comprised of milky white quartz with various amounts of sulphide minerals. Two quartz veins, 1 m apart and exposed on Peak 400 at RDS6, 4+25W, cut quartz-carbonate altered, agglomeratic lapilli tuff. The veins contain 2 to 5% pyrite, up to 2% chalcopyrite, trace sphalerite and trace malachite. Samples collected from the veins yielded the following results:

2.7 g/t Au, 7.8 ppm Ag, 472 ppm As (16101), 1.8 g/t Au, 4.8 ppm Ag (16309); 0.8 g/t Au, 14.2 ppm Ag, 2037 ppm Cu, 2697 ppm Zn (16308) and 0.2 g/t Au, 5.3 ppm Ag, 1902 ppm Cu, 1653 ppm Zn (16310).

On the Peak 500 road, approximately 500 m north of RDS6, 4+25W, two quartz veins oriented at right angles to the Peak Lake Fault are separated by 1 m of altered lapilli tuff. Both veins average 3 cm in width and contain up to 25% combined pyrite and chalcopyrite and samples of the veins yielded the following results: 40 ppb Au (16241) and 1.1 g/t Au, 24.0 ppm Ag, 1465 ppm Cu (16242).

A second zone of quartz veining, related to a northwest trending fault which is apparently offset by the Peak Lake fault, lies 250 m due south of the veins discussed above. Seven quartz veins are exposed by the Peak 50 roadcut and have an average orientation of 113^{o}. Vein widths range from 2 cm to 10 cm and contain up to 20% pyrite, 2% chalcopyrite and trace malachite. Samples collected from the veins yielded the following results; 482 ppm Pb (16362); 548 ppm W (16364); 0.5 g/t Au (16366); 20 ppb Au, 1135 ppm Cu (16367) and 1.7 g/t Au, 12.9 ppm Ag, 1943 ppm Cu (16368).

A third area of quartz veining within the Peak Lake zone includes the Emma adit. The portal is now completely covered following past attempts at trenching in an effort to more fully expose the quartz veins. Three veins are presently exposed by the trench. The veins range in width from 5 to 15 cm and contain up to 40% massive pyrite pods to 3 cm with 1 to 2% molybdenite. Vein orientations average 026^{o} with steep southwesterly dips. Samples collected from the veins and from well mineralized material in the waste dump returned the following results: 100 ppb Au, 433 ppm Mo (16369) and from the same vein 10 m along strike, 80 ppb Au, 1723 ppm Mo (16371); 109 ppm Mo (16373); and 30 ppb Au, 143 ppm Mo (20956). Two quartz veins are exposed by the Peak 50 roadcut approximately 100 m to the northeast along strike and at the same orientation as the veins exposed at the Emma adit. Samples of the veins yielded the following results: 1150 ppm Cu (16352) and 30 ppb Au (16354). Samples collected from float vein material returned the following results: 59 ppm Mo (16356) and 0.3 g/t Au, 10.5 ppm Ag, 3536 ppm Cu, 114 ppm Mo (2951). In addition, a sample of altered basalt wallrock yielded an analysis of 20 ppb Au (16353).

Two quartz veins, exposed by trenching of the CM-241 roadbed, lie approximately 200 m south of the Emma adit. The first vein is approximately 10 cm wide with up to 40% pyrite ± chalcopyrite and trends east-west. Samples of the vein collected in place and from float material yielded the following results: 357 ppm Mo (16243) and 40 ppb Au, 6132 ppm Cu (16245). Samples from the second vein (3 cm wide quartz with 15% pyrite) did not yield significant results.

Approximately 400 m north of the Emma adit on Peak Main, a zone of quartz-iron carbonate altered agglomeratic lapilli tuff with numerous quartz-carbonate veins is exposed by the roadcut. The veins average 3 cm in width and trend northwesterly. Pyrite comprises up to 20% of the veins with traces of chalcopyrite and malachite. Samples of the veins yielded the following results: 0.3 g/t Au, 14.1 ppm Ag (16290); 9.7 ppm Ag (16291); 50 ppb Au, 14.0 ppm Ag (16292); and 3422 ppm Cu (16296). A float quartz vein sample collected 200 m to the northwest yielded an assay of 0.3 g/t Au (16297).

Twelve additional veins in the Peak Lake zone yielded analyses between 20 and 100 ppb Au.

The CM-240 zone is located 1800 m north of Peak Lake and is crossed by roads P211, P200 and CM-240. Numerous north-northeast trending quartz and quartz-carbonate veins cut thin-bedded tuffs, cherty tuffs and cherty argillaceous tuffs. The host rocks trend north-south with steep easterly dips and are typically fractured and sheared with 2% ubiquitous pyrite. Quartz-carbonate breccia veins, up to 15 cm wide, with 20% pyrite and up to 1% sphalerite yielded the best results within the zone: 1.2 g/t Au, 6939 ppm Zn (16217) and 0.2 g/t Au, 3660 ppm Zn (16218). A sample collected from a 3 cm quartz vein with 50% pyrite and trace chalcopyrite yielded analyses of 0.5 g/t Au, 17.1 ppm Ag and 1784 ppm Cu (16220). A sample of carbonatized basaltic tuff collected near sample 16220 yielded an assay of 0.2 g/t Au with 1419 ppm Cu (16221). Two samples from a 15 cm quartz vein with trace pyrite returned analyses of 30 ppb Au (16283) and 80 ppb Au (16284). A 4 cm quartz vein with 1-2%, 1 cm pyrite blebs, exposed by the P200 roadcut yielded an analysis of 150 ppb Au with 85 ppm Mo. Samples of the host rock in the CM-240 zone also returned elevated gold values, specifically sample 16287, 80 ppb Au and sample 16288, 30 ppb Au, both from silicified, argillaceous tuff and up to 20% fine pyrite.

The Debeaux Creek zone is located central to the Su 2 claim. The zone is characterized by locally strongly carbonatized basaltic andesite volcaniclastics and extensively serpentinized diabasic gabbro. The serpentinite is strongly magnetic with local concentrations of massive magnetite to 20%. Other magnetic minerals may include ilmenite and pyrrhotite. The zone of serpentinization shows up on aerial magnetometer surveys as a large magnetic 'high' overlying Debeaux and McKinlay Creeks. The serpentinite has been explored in years past by the driving of a 3 m adit in the upper reaches of Debeaux Creek. A sample collected in the adit returned 913 ppm Cr and 382 ppm Ni (16232). Results from other samples of the serpentinite include 1310 ppm Ni, 261 ppm Cr (16323) and 426 ppm Ni, 376 ppm Cr (16276). Carbonate veins cutting the serpentinite also exhibit enrichment in nickel and chromium: 441 ppm Ni, 293 ppm Cr (16324) and 253 ppm Ni, 255 ppm Cr (16325). A 5 cm carbonate vein cutting basalt near the contact with the serpentinite yielded an analysis of 200 ppb Au with 236 ppm Cr (16275). Samples which showed enrichment in chromium and nickel were re-analysed for platinum and palladium; however, results from these analyses were not significant.

The Kammat Creek zone lies in the western half of the Emma 21 claim. Kammat Creek is a surface expression of the Kammat-Debeaux fault. A number of graphitic, quartz-carbonate flooded shear zones were sampled (samples 16381 to 16387) and the results of the analyses show depletion of most elements. The most significant mineralization in the zone occurs in talus boulders in the washed out banks of the lower reaches of the creek. Rounded boulders (up to 1 m in diameter) of jasper, silicified fine volcanic sediments and massive magnetite are abundant on the west side of the creek. A sample of layered jasper, hematite, and pyrite (16380) yielded an analysis of 290 ppb Au. Samples of silicified volcaniclastic rocks with up to 90% massive pyrite returned the following results: 130 ppb Au (16375); 217 ppm Ni, 315 Co ppm (16376, 80% pyrite); 40 ppb Au (16377); 50 ppb Au (16378); and 40 ppb Au, 5.2 ppm Ag, 103 ppm Co (16379, 90% pyrite). A sample of massive magnetite (16374) yielded a result of 20 ppb Au. The source of the mineralized boulders appears to be a pyritic exhalite sequence exposed on the road which parallels and eventually crosses Kammat Creek, upstream from the sample sites. Where sampled in place (16301), the pyritic jasper did not yield significant results upon analysis. A 9 cm rounded cobble of massive chalcopyrite and pyrite with minor quartz was found in the roadbed of River Road 5 m west of Kammat Creek and a sample (16388) yielded the following: 2.4 g/t Au, 54.9 g/t Ag, 25.4% Cu and 365 ppm Pb.

A number of samples on the Su 3 claim show enrichment in gold. Sample 16327, a 10 cm quartz-epidote breccia vein with trace pyrite exposed by the Cop 410 roadcut, yielded an analysis of 30 ppb Au. Sample 16329, a 3 cm quartz vein with trace pyrite also on Cop 410, returned analyses of 117 ppm Ni and 335 ppm Cr with 8 ppb Pd. The best result on Su 3 was returned by a 5 cm quartz vein cutting basalt with 20% combined pyrite; 260 ppb Au (16332). A sample of jasper with 10% pyrite and 20% specular hematite (16339) returned 20 ppb Au.

With very few exceptions, nearly all analyses and assays of significance were obtained from quartz veins with some degree of sulphide mineralization. Of particular importance is the direct relationship between gold content and sphalerite mineralization as evidenced at the High Grade vein. This relationship is also observed in the Peak Lake zone on surface and at depth as will be discussed in the section on drilling results. Of the zones discussed in this section and to the extent that the zones have been explored during Phase I, the Peak Lake zone exhibits the greatest potential to host a significant number of gold-zinc bearing quartz veins.

5.2.4 Silt Sampling

A total of 4 silt samples was collected from streams draining the Emma property.

Sample 87-CC-1 was collected in Debeaux Creek 100 m above the confluence with China Creek. The sample yielded slightly anomalous values for nickel (110 ppm Ni) and chromium (324 ppm Cr). The source of the anomalous values is almost certainly the serpentinite zone identified upstream.

Sample Silt-2 was collected in a tributary to Kammat Creek and yielded a gold analysis of 20 ppb Au. While not strongly anomalous, the gold result may indicate mineralization on the east side of Kammat Creek which was not identified during surface mapping.

Samples Silt-1, collected in McKinlay Creek, and Silt-3, collected in a stream draining the north end of the Su 3 claim, returned negligible geochemical analyses.

5.3 SOIL GEOCHEMISTRY SURVEY

5.3.1 Survey Description

Sample pits were dug using grubhoes to a depth of approximately 25 cm and samples placed in kraft bags for shipment to the lab. Wherever possible, the "B" soil horizon was selected for analysis. "B" horizon soil within the survey area varies from moderately to well developed.

Surface disturbances caused by road building and skidder trails are extensive and a number of the soil anomalies that were outlined may have cultural sources, as indicated on Figures 8 to 11.

Frequency and cumulative frequency histograms were plotted for each of silver, copper and zinc and are found in Appendix IIe. For the purposes of this report, the following values are defined.

Background	- Mean
Threshold	- 97.5 Percentile
Weakly Anomalous	- Threshold + 2 Standard Deviations
Moderately Anomalous	- Threshold + 4 Standard Deviations
Strongly Anomalous	- Threshold + 6 Standard Deviations

Results from the gold analyses were not subjected to statistical analysis due to the strong skewness of the gold data. Instead, anomalous values were arbitrarily selected which outline patterns of significant enrichment. Table II summarizes the resultant contour intervals, background values and sample populations.

Table II

GEOCHEMICAL CONTOUR INTERVALS

	Au	Ag	Cu	Zn
Sample Population	777	777	777	776
Background	5	0.2	77	90
Threshold	15	0.5	160	200
Weakly Anomalous	50	0.9	250	310
Moderately Anomalous	100	1.3	340	420
Strongly Anomalous	200	1.7	430	530

5.3.2 Discussion of Results

Zone 1, High Grade Zone (Au, Ag, Cu, Zn)
Zone 1 consists of coincident gold, silver, copper and zinc anomalies. The zone extends from line 4+00N to line 0+00, is centred about 4+00W, averages 100 m in width and is open to the south. Gold values range from 15 ppb Au to 2620 ppb Au in a background of 5 ppb Au. Silver values range from 0.5 ppm Ag to 2.4 ppm Ag in a background of 0.2 ppm Ag. Copper values range from 164 ppm Cu to 356 ppm Cu in a background of 77 ppm Cu. Zinc values range from 250 ppm Zn to 620 ppm Zn in a background of 90 ppm Zn. This area is extensively quartz veined and includes the High Grade vein. Grab samples from the High Grade vein yielded assay results of up to 149.4 g/t Au, 115.2 g/t Ag, 1.00% Cu and 21.28% Zn (samples 16211, 16211B, 16215B). The soil anomalies are strongest on line 4+00N where road building may have transported and concentrated vein material. However, the elongated outlines and strengths of the gold and zinc anomalies support a geological source, i.e., mineralized quartz veins, in Zone 1.

Zones 2a, 2b, 2c (Au, Cu)

Zone 2a consists of coincident gold and copper anomalies. The zone extends from line 6+00N to line 9+00N, is up to 125 m wide and is centred about the baseline. Gold values range from 20 ppb Au to 450 ppb Au in a background of 5 ppb Au. Copper values range from 166 ppm Cu to 229 ppm Cu in a background of 77 ppm Cu. Also, within Zone 2a, there are two weak, single sample silver anomalies on lines 6+00N (0.5 ppm Ag) and 8+00N (0.6 ppm Ag with 224 ppm Zn).

Zone 2b extends from line 8+00N, 1+25W to line 9+00N, 0+50W with values of 420 ppb Au and 320 ppb Au on lines 8+00N and 9+00N respectively. Zones 2a and 2b coalesce at baseline, 9+50N. Both Zone 2a and 2b roughly parallel northeast trending fault structures. The northeast trending faults are either truncated by or are splays of the north-south trending fault which parallels the baseline. This pattern of fault intersections is reflected in the Zone 2a and 2b anomaly outlines which strongly suggest a structural control on gold-copper enrichment in the soils.

Rock samples collected from two quartz veins in Zone 2a yielded analyses of 40 ppb Au (sample 16228) and 20 ppb Au (sample 16257). In addition, a rock sample collected from a quartz vein located between Zones 2a and 2b returned an assay of 2.3 g/t Au (sample 16216).

Zone 2c extends from the point of convergence of Zones 2a and 2b to line 13+00N, 2+00W. Gold values range from 20 ppb Au to 160 ppb Au. However, this zone parallels logging road CM-240 and may be caused by material displaced during road building.

Zone 3 (Zn, Ag (Cu))

Zone 3 consists of coincident zinc and silver anomalies on lines 0+00N and 1+00N. The zone extends from 4+25E to 5+75E on line 0+00N and from 5+25 to 5+75E on line 1+00N. Zinc values range from 205 ppm to 559 ppm Zn. The silver anomaly consists of single anomalous samples yielding 0.6 ppm Ag on line 0+00N at 5+75E and 0.6 ppm Ag on line 1+00N at 5+50E. A source for the soil enrichment was not observed during sampling. The anomalous samples were collected within 25 m of logging roads and may be the result of material transported during road building.

Zone 4 (Au, Ag, Cu, Zn)

Zone 4 extends from line 7+00N, 6+00E to line 9+00N, 5+25E with a maximum width of 75 m. Gold values range up to 80 ppb Au, silver values to 1.2 ppm Ag, copper values to 178 ppm Cu and zinc values to 243 ppm Zn. Zone 4 overlies numerous skidder trails and a logging road and hence, the actual size and shape of the anomaly may be exaggerated.

In addition to the above mentioned zones, numerous spot anomalies and single element anomalies are present in the northern portion of the grid. Most notable in this regard is gold. Several narrow gold anomalies are present across lines 11+00N through 15+00N. Gold values in these anomalies range up to 340 ppb Au. This portion of the grid lies below the break in slope in dense bush and a source for the anomalies was not discovered.

5.4 IP/RESISTIVITY SURVEY

The following IP survey was conducted by MPH Consulting Limited geophysicists from July 12, 1987 to August 6, 1987.

Interpretation of the geophysical data shown in accompanying maps and the following section of the report is by J. Roth, M.A. of MPH Consulting Ltd.

5.4.1 Survey Description

IP/resistivity surveys were carried out in two areas indentified as favourable on the Emma property, namely, the High Grade and the Peak Lake zones.

In the area of the High Grade zone, lines 0+00, 2+00N, 4+00N and 6+00N (which trend east-west) were surveyed. In addition, IP survey traverses were run along road P-200 over the High Grade vein itself and along the CM240, Mid and River Roads to the north on a reconnaissance basis.

In the Peak Lake zone, IP measurements were carried out on eight logging roads which trend roughly east-west transverse to stratigraphy and structural grain.

The survey was carried out using Huntec time-domain instrumentation consisting of a 2.5 kW transmitter and a MK IV receiver. The dipole-dipole array was used throughout with an "a" spacing of 25 m read to an "n" separation equal to 4. The parameters of primary voltage (Vp) and secondary voltage (Vs) over ten windows from 0.1 seconds to 1.1 seconds were measured for each dipole pair during the survey. The total chargeability was selected as optimal for purposes of display. Details of the IP/resistivity method and equipment specifications are found in Appendix VI a, b.

The calculated apparent resistivities and chargeabilities plotted in standard pseudosection format may be found in Appendix VIII (Figures 16 through 31). Note that along the road traverses, the apparent resistivities are calculated assuming a straight line and are moderately in error due to local kinks and bends in the roads. In order to better appreciate the topography and its distorting effect on the pseudosection plots, terrain compensated pseudosection plots were prepared for line 0+00 through 6+00N. In these plots, the actual locations of the dipoles and the actual terrain profiles are used to produce pseudosection plots that partially correct for the variation in the horizontal distance between the dipoles due to irregular terrain.

Observed chargeability highs and resistivity lows are indicated on each pseudosection providing a graphic characterization of the anomaly source location, strength and geometry. The apparent resistivity and total chargeability for the first separation (n=1) have been plotted in plan contoured form comprising Figures 12 and 13 for the High Grade zone and Figures 14 and 15 for the Peak Lake zone. Also shown on these maps are the chargeability highs and resistivity lows interpreted from the pseudosections. The most significant of these anomalous features have been given alphabetic designations as shown in the attached maps.

5.4.2 Survey Results

High Grade Zone

As seen in Figure 12, the **resistivity** results show the High Grade zone to be predominantly underlain by resistive to strongly resistive bedrock concealed by thin to negligible overburden. A number of local resistivity lows, generally of moderate contrast with the surrounding resistive host lithologies, were detected in the course of the survey. Four of these zones form apparently persistent anomalous features or correlate with chargeability highs.

Resistivity low a, defined on lines 2+00N and 4+00N, exhibits reasonably close correlation with chargeability Zone A.

Resistivity low e is confined to traverse P200 where it is weakly expressed immediately north of line 2+00N.

Resistivity low f, the most persistent resistivity low defined in the survey, extends from lines 0+00 through 6+00N in a generally north-south direction. On lines 0+00 and 2+00N, the resistivity low is immediately to the west of chargeability Zone F. Elsewhere, however, it departs from the chargeability trend. It would appear the resistivity low f is unrelated to chargeability Zone F. Hence, the low could reflect an unmineralized fault whose trace follows the nearly north-south valley.

The fourth resistlvity low of some persistence and extent is located along the western margin of line 0+00 and 4+00N. It likely represents a transition to a considerably more conductive lithology.

The **chargeability** results over the High Grade area indicate seven significant chargeability zones designated A through H, plus several additional weak and/or isolated chargeability sources.

Chargeability **zone A** consists of weak to moderate IP sources detected on lines 2+00N and 4+00N defining an approximately east-northeast trend. In addition, the chargeability zone was detected on traverse P200. The strongest response was detected on line 4+00N where a narrow source with an intrinsic chargeability of approximately 40 ms is associated with resistivity low a.

Apparently, Zone A does not extend much further south than line 2+00N. A weak anomaly detected on line 0+00 at an estimated depth of 20 m near 4+30W may represent an attenuated continuation of this feature terminating to the north of line 0+00. To the north-northeast, a similarly weak response on line 6+00N near 3+25W could reflect a very attenuated extension of Zone A. However, in the present interpretation, this is regarded as a continuation of the adjacent Zone B. The chargeability response on line 2+00N is similarly ambiguous. It appears to consist of a narrow, shallow, weak feature embedded in a broad, multiple, moderate anomaly source. It may reflect a southern continuation of Zone A, but its western half may constitute a continuation of Zone B as well. Lower resistivities accompany a portion of the higher chargeabilities on line 2+00N.

A number of boreholes have been completed to test Zone A and/or test the geological environment in the IP source. Drillholes EM87-5 and 87-2 recorded significant intervals of disseminated sulphides whose location and extent largely correlate with the chargeability data. Conversely, drillholes EM87-3 and 87-4, drilled parallel to and to the east of the trend of the chargeability feature in an effort to test transverse fault zones with an associated quartz vein, recorded slightly lower sulphide intervals.

Zone B is principally defined by broad, complex responses detected on the western portion of line 4+00N and the western portion of traverse P200. The chargeability sources are of moderate intensity and including their downdip or depth portion, could be as wide as 75 m. A weak anomaly on line 6+00N may represent a northern extension of Zone B, while a portion of the moderate, complex anomaly on line 2+00N may represent a southern extension. Zone B is generally accompanied by high resistivities, suggestive of a feature containing low to minor disseminated sulphides.

Zone C is indicated by moderate to moderately strong chargeability sources detected along the western portions of traverse P200 and line 6+00N. The chargeability source is clearly defined on line 6+00N where it is accompanied by a shallow, moderately strong resistivity low. Zone C is not fully delineated to the north-northeast. However, it does not extend as far as traverse CM-240 as an equivalent response was not detected.

Zone D consists of a moderately strong IP response near 0+00 on traverse CM240 and a moderate response on line 6+00N near 1+15W. Resistivities accompanying the chargeability sources are generally high, suggesting a moderate concentration of predominantly disseminated sulphides as the probable source.

Zone E, located nearly due south of Zone D, is defined by moderate anomalies on line 0+00 and 2+00N and an equivalent response on traverse P-200. On line 2+00N, Zone E has the characteristics of a multiple source anomaly. Zone E is open to the south. No anomalous response was detected on line 4+00N to suggest continuity between Zones D and E. Consequently, these two zones have been given separate designations. Resistivities comprising low e and accompanying the chargeability highs constituting Zone E, are slightly lower on traverse P200. On lines 0+00 and 2+00N, twin resistivity lows e and e' bear partial correlation with portions of the chargeability feature. Consequently, a source consisting of weakly disseminated sulphides is inferred.

Zone F consists of generally weak chargeability sources detected on lines 0+00 and 2+00N near 0+50E. Resistivities accompanying the weak chargeabilities are generally high. Resistivity low f follows the stream immediately to the west of the chargeability zone and appears to be unrelated to the chargeability source. Consequently, minor sulphides in a generally unaltered resistive matrix are probably the source for Zone F.

Zones G and H are adjacent and possibly related chargeability sources detected in the east-central part of the survey along traverse CM240 and line 4+00N. On line 4+00N, the chargeability feature appears to consist of two separate shallow sources of moderate and moderately strong intensity respectively, separated by an interval of lower polarizability. On traverse CM240, a broad envelope of weak polarizability contains within it a narrower, moderately strong response at an estimated depth of 10 m. This anomaly, designated G, forms a trend of nearly north-south with part of the anomaly on line

4+00N. A further weakly polarizable, narrow source detected to the southeast on traverse CM240 constitutes Zone H. This may be continuous with part of the chargeability source recorded on line 4+00N.

Zone G is open to the north and Zone H, if indeed as presently interpreted, may be open to the northeast. Additional survey coverage on intervening lines is required to fully define and characterize these multiple polarizable sources. Both Zones G and H are accompanied by high resistivities suggesting sources containing minor to moderate disseminated sulphides.

In addition to the zones already discussed, a series of weak chargeability features was detected on the River Road traverse north of the High Grade zone. Although weak in polarizability, three of the IP zones are apparently accompanied by slightly lower resistivities, suggesting the possibility of sulphide or graphite stringers or laminae. None of the other traverses are close enough to River Road or extend far enough to the east to define possible southern continuations of these anomalous features. They are similarly open to the north. Additional surveying in this sector is warranted, if geochemical and/or geological encouragement is forthcoming, to better define the polarizable sources and their apparent accompanying resistivity lows.

Thus, in the High Grade sector, the IP/resistivity surveys defined a number of narrow, moderate to moderately strong responses displaying a measure of association with gold prospects and geochemical anomalies. The distinct decrease in chargeability sources north of approximately 8+00N points to a distinct change in host lithologies or intensity of mineralization, suggesting in turn a considerably lower potential for this part of the property.

Additional IP surveying is warranted both on fill-in lines and to extend the basic coverage somewhat to the north and south to determine the full extent and definition of the chargeability features detected to date.

In addition to the features discussed above, the apparent termination of all the chargeability anomalies along a line trending north-northwest in the southwestern part of the survey area suggests the presence of a fault. Similarly, the apparent disruption of chargeability anomalies in the centre of the property suggests a possible fault extending northwest-southeast across the centre of the survey grid, although in this instance there is no topographic support for such a feature.

Peak Lake

In the Peak Lake zone a series of logging roads designated RDS1 through RDS8 were surveyed. The logging roads extend generally northeast-southwest following the average topographic oontours and generally transverse to stratigraphy and structural trends. The **resistivity** results, as portrayed in Figure 14, show generally high bedrock resistivities, typically in excess of 5000 ohm-m.

A number of local resistivity lows stand out in the otherwise resistive terrain. Several of the more notable and extensive resistivity lows are most probably due to local conductive overburden, such as on traverses RDS3 and RDS4. However, several other narrow, local resistivity lows are judged to derive from bedrock sources and are discussed briefly below.

Resistivity low k extends in a northwest direction from traverse RDS1 through RDS3. A narrow, linear, moderate resistivity low, it exhibits a reasonably consistent position along the boundary between chargeability zones J and K.

Resistivity lows m and m' form a parallel pair of narrow, moderate resistivity lows detected along the western side of traverses RDS2 through RDS5. The resistivity lows exhibit a fairly consistent relationship with chargeability zone M and hence are regarded as of probable bedrock origin.

Two isolated resistivity lows are also noted which correlate with local portions of considerably more extensive chargeability features. These comprise resistivity low i on traverses RDS1 and RDS3 which is associated with chargeability zone I and a resistivity low of questionable character noted on traverse RDS3 and possibly associated with chargeability zone J.

A further resistivity low of linear aspect and considerable continuity is found in the western side of the survey area as detected on traverses RDS5 through RDS7. It extends south from the southern end of Peak Lake, with its southern extent undefined by the present survey coverage. This resistivity low lacks any correlating chargeability high and hence may well reflect a late fault unaccompanied by sulphide mineralization.

The chargeability results at Peak Lake produced a somewhat unexpected complex anomaly extending on average north-south across the central part of the area surveyed. This anomaly as a whole corresponds to a sector in which sulphide-rich agglomerate has been noted on surface samples and in drill core. It may correspond to a local centre for volcanic eruptions which has subsequently been affected by hydrothermal solutions with accompanying precipitation of pyrite and pyrrhotite. This general area is also notable for a number of highly anomalous gold values obtained from soil geochemical sampling. However, the soil gold anomalies tend to cluster along the western margin and immediately west of the main chargeability feature.

In detail, the composite chargeability source has been divided into a series of quasi-linear zones designated I through M as seen in Figure 15. These are discussed in somewhat greater detail below.

Zones I, J and K are subparallel portions of the main anomaly. On some lines the individual components of the anomalous responses are reasonably distinguished and separable from one another. However, on other lines they blend together to give a broad composite response.

Zone I is defined to extend from traverse RDS6 southwards to traverse RDS1, with a probable further continuation to the south of southeast beyond the limits of the present area surveyed. Zone I generally exhibits strong chargeabilities with somewhat lower values indicated at its northern and southern extremities. The chargeability sources are in general not accompanied by any particular decrease in resistivity, although slightly lower resistivities are noted accompanying the chargeability source on traverse RDS1. Hence, in general a source consisting of a moderate concentration of largely disseminated sulphides is the probable source.

Zone I was substantially tested by drillhole EM 87-9 near or between traverses RDS4 and RDS5. A substantial intersection of sulphides typically in the range of 3 to 10% was encountered. Gold values, unfortunately, were low to negligible in this hole.

Zone J is a strong chargeability source defined as extending approximately north-south from traverse RDS4 through traverse RDS2. It is most clearly resolved on traverse RDS-3 as a feature separate from adjoining zones I to the west and K to the east. In general, the chargeability sources forming zone J do not exhibit any significant decrease in resistivity. However, on traverse RDS3, slightly lower resistivities are seen immediately east of the main anomalies comprising zone J. Thus, a plausible source for zone J would be one or more intervals of moderate to heavily disseminated sulphides in a broader interval that carries weakly disseminated sulphides.

Zone J was substantially tested by drillhole EM 87-10 near its northern extent near traverse RDS4. Significant sulphides, generally disseminated but occasionally stringer in character, were intersected but lacked any accompanying significant gold values.

Zone K, lying immediately east of zone J and parallel to it, is defined to extend south from traverse RDS7 to traverse RDS2. The chargeability source is generally strong and in places composite, consisting of several bands each exhibiting a high chargeability. Accompanying resistivities are generally high, with the exception of traverses RDS3 and RDS2 where a narrow resistivity low is partially associated with the main chargeability component. Anomaly intensity weakens notably north of traverse RDS5, much as was the case with zone I. A plausible source for zone K is a series of narrow horizons containing heavily disseminated to stringer sulphides and probably resembling the character of zones I and J as tested by drillholes.

Zone L constitutes a narrow, moderately strong source embedded in a broad envelope of weak chargeability values that forms the western margin to the main anomalous mass. Zone L is defined on traverses RDS7 and RDS6 as a narrow source at depths estimated between 10 and 20 m. Accompanying resistivities exhibit no notable decrease. Consequently, a possible source for zone L would be a narrow interval of moderate disseminated sulphides enclosed in a host containing 1 to 2% disseminated sulphides.

Zone M is located apart from the main chargeability anomaly along the southwestern part of the area surveyed. It is a narrow, moderately strong chargeability source trending approximately north-northwest. This different orientation distinguishes it from the other chargeability features in the Peak Lake area. The chargeability sources comprising zone M are associated with narrow, moderate resistivity lows comprising lows m and m'.

In detail, however, the principal chargeability source appears to be slightly offset from the location of the resistivity low, suggesting a weakly mineralized or unmineralized fault parallel to the main section of sulphide-bearing rock.

The location and trend of zone M suggest that it is related to the Peak Lake fault extending southwards from Peak Lake. The overall character and setting are similar to mineralization on the Yellow and Debbie properties. Zone M was partially tested by drillholes EM87-6 and EM87-7 near its northern end where the gold geochemistry appeared more favourable. The presence of gold values, particularly in drillhole EM87-6, supports the desirability of further evaluation of this combined IP/structural target.

The termination of significant chargeability responses immediately north of traverse RDS7 is quite remarkable. The likelihood of a termination by cross faulting is entirely possible although no supporting evidence for the presence of such a fault is seen in either the resistivity data or the terrain features. Conversely, although weakening in intensity, chargeability zone I remains open to the southeast.

5.4.3 Discussion

The two areas surveyed with IP on the Emma property contrast notably in terms of the observed chargeability responses and hence likely differ significantly as to the concentration and extent of sulphide mineralization present in these areas.

At Peak Lake, a strong composite IP anomaly of apparently limited strike extent possibly related to local volcanic activity and/or hydrothermal activity was detected.

In the High Grade area, by contrast, a series of narrow low to moderate IP sources were detected, scattered over a good part of the area surveyed, although exhibiting a tendency to decrease in number and intensity to the north. The character of these anomalies would be consistent with either narrow stratigraphic horizons or structural zones or a combination of both.

Finally, inspection of the government aeromagnetic data showed no significant magnetic features in the eastern portion of the property. Hence, no support was obtained for the possibility of a concealed intrusive in the Peak Lake or High Grade areas.

5.5 1987 DIAMOND DRILLING PROGRAM

5.5.1 Program Outline

A total of 1511 m of drilling was completed in 12 holes using NQ wireline equipment. Burwash Enterprises Ltd. completed the contract using a unitized Longyear 38 skid-mounted drill during the period October 13 through November 2, 1987. Drill setups were provided by existing roads and skidder trails and surface disturbances were minimal. Drillhole data are summarized in the following table:

Table III

DRILLHOLE DATA

Drillhole	Grid Coordinates	Elevation (m)	Length (m)	Dip°	Azimuth°
EM87-1	4+62N, 3+33W	940	117.95	-50	230
EM87-2	4+62N, 3+33W	940	169.46	-50	180
EM87-3	4+34N, 3+06W	930	60.04	-50	230
EM87-4	4+00N, 3+00W	935	44.50	-50	230
EM87-5	3+48N, 4+00W	970	199.63	-50	340
EM87-6	RDS4, 6+00W	920	78.02	-50	045
EM87-7	RDS4, 6+00W	920	102.71	-70	045
EM87-8	RDS4, 2+00W	890	163.36	-50	280
EM87-9	RDS4, 2+00W	890	121.00	-70	280
EM87-10	RDS4, 1+05W	875	121.00	-50	280
EM87-11	RDS6, 1+60W	993	178.91	-50	280
EM87-12	RDS6, 3+35W	995	154.22	-50	110

Drillhole locations are shown in Figures 6 and 7; sections are plotted in Figures 32 to 41; drill logs are compiled in Appendix IX.

5.5.2 Drillhole Summaries

The 1987 diamond drilling program focussed on two areas, specifically the High Grade zone and the Peak Lake zone. Five drillholes totalling 592 m in length were completed in the High Grade zone and 7 drillholes totalling 919 m were completed in the Peak Lake zone.

High Grade Zone

EM87-1 (Figure 32)
The objective of EM87-1 was to test a potential northward strike extension of the High Grade vein. Pyroxene porphyritic, agglomeratic lapilli tuff was intersected directly below the casing whereas fine cherty tuff and fine lapilli tuff are mapped on surface. This would suggest that the finer-grained volcanics are a thin veneer overlying coarser material. The agglomeratic lapilli tuff grades downhole into flow breccia. At a depth of 45.64 m, there is an abrupt change to intercalated medium-grained tuff, fine tuff and cherty tuff. At a depth of 96.15 m, the fine volcanic sediments grade rapidly into agglomeratic lapilli tuff which persists to the end of the hole. All lithologies encountered exhibit some degree of carbonate alteration with more intense carbonatization occurring in the fine tuffs and flow breccia. Epidote alteration is present locally over 1 m intervals. Finely disseminated pyrite is present throughout the hole to 1%.

A possible strike extension of the High Grade vein occurs between 25.34 m and 25.61 m (sample 23656) and yielded analyses of 65 ppb Au, 5.2 ppm Ag and 0.284% Cu. The quartz vein is slightly higher in the drillhole than the projected intersection, however, nearby faults have probably offset the position of the vein. While the intersected vein did not yield extremely anomalous values as did the High Grade vein, it does resemble the High Grade vein mineralogically with the exception of sphalerite.

The best gold assay in the hole was yielded by a 3 cm quartz vein between 103.23 and 103.28 (sample 23794), 1.40 g/t Au with 0.54% Zn, 125.4 ppm Cd and 81 ppm Pb.

A summary of significant intersections in EM87-1 follows:

Sample	Interval (m)	Length (m)	Au ppb	Ag ppm	Cu ppm	Zn ppm	Other ppm
23656	25.34-25.61	0.27	65	5.2	0.284%	95	
24850	74.98-75.26	0.28	107	0.7	71	47	
23794	103.23-103.28	0.05	1.40g/t	4.1	335	0.54%	125.4 Cd 81 Pb
23797	107.67-107.74	0.07	65	2.1	0.355%	89	

EM87-2 (Figure 33)
The objective of EM87-2 was to test IP anomaly 'A' and the Zone 1 soil geochemistry anomaly.

The uppermost 7 m of the hole encountered medium-grained tuff and laminated cherty tuff. Progressing down the hole, the rocks coarsen through lapilli tuff, agglomeratic lapilli tuff and into flow breccia to 56.44 m. Below 56.44 m, the rocks exhibit abrupt lithology changes between fine to medium-grained tuffs and lapilli tuffs to agglomeratic lapilli tuff. The rocks are variously interlayered and in fault contact.

Characteristic, intense quartz-epidote alteration of the agglomeratic lapilli tuff (solution breccia) occurs between 75 and 90 m. Abundant quartz-carbonate veins within this zone contain various amounts of sulphide, generally greater than 5% and up to 75%, including sphalerite, chalcopyrite, and pyrite. Sample 24896 includes a 3 cm quartz-carbonate vein with 50% sphalerite and yielded the highest gold assay in the hole; 1.98 g/t Au with 20.00 ppm Ag, 4320 ppm Cu, 64340 Zn and 817 ppm Pb over 0.18 m. A second carbonate vein within the zone yielded assays of 1.18 g/t Au and 22.3 g/t Ag over 0.13 m.

All units encountered in the hole exhibit some degree of carbonatization with local 1 m zones of pervasive carbonatization associated with faults and fractures. Epidote alteration increases down hole to a maximum within the solution breccia below which there are local intervals of mild epidotization.

The source of IP anomaly A is probably 2% ubiquitous disseminated pyrite in the top of the hole with local concentrations to 20%. A bedrock source for the Zone 1 soil anomaly was not intersected. The following table summarized the significant intersections in EM87-2:

Sample	Interval (m)	Length (m)	Au ppb	Ag ppm	Cu ppm	Zn ppm	Other ppm
23807	73.87-73.97	0.10	25	5.9	0.363	92	
23808	77.30-77.43	0.13	1.18 g/t	22.3 g/t	410	111	112 Pb
23896	87.70-87.88	0.18	1.98 g/t	20.0	4320	64340	1227.8 Cd
							817 Pb
23809	95.08-95.21	0.13	32	1.4	120	0.34%	91.6 Cd
23811	106.09-106.20	0.11	1.22 g/t	18.5 g/t	0.332	124	
23812	114.70-114.80	0.10	87	2.4	0.215%	3.73	1295.9 Cd
23813	115.06-115.20	0.14	112	1.1	774	0.32%	113.5 Cd

EM87-3 (Figure **34**)

The objective of EM87-3 was to test the northward strike extension of the High Grade vein.

A sequence of volcaniclastic rocks exhibiting abrupt changes in clast size was encountered from the casing to the bottom of the hole. Intervals of cherty tuff, fine- to medium-grained tuff, lapilli tuff and agglomeratic lapilli tuff vary in thickness from 1 to 10 m.

Moderate carbonate alteration is present throughout the hole accompanied locally by strong quartz-epidote alteration. Disseminated pyrite to 3% is ubiquitous with concentrations to 20% in quartz-carbonate veins. A 2 cm quartz-carbonate vein with 15% pyrite and 5% hematite between 56.08 m and 56.16 m returned an assay of 2.31 g/t Au.

A quartz vein intersected between 14.59 m and 14.92 m with 10% pyrite, trace chalcopyrite and trace sphalerite closely correlates with the projected intersection with the High Grade vein. Analytical results from the vein are as follows:

Sample	Intervals (m)	Length (m)	Au ppb	Ag ppm	Cu ppm	Zn ppm
24687	14.59-14.73	0.14	31	1.7	669	209
24688	14.73-14.92	0.19	54	2.2	1420	81

EM87-4 (Figure 35)
The objective of EM87-4 was to intersect the High Grade vein at depth.

The hole encountered alternating, 3 m to 4 m intervals of fine- to medium-grained tuff and agglomeratic lapilli tuff. Weak epidote alteration is present throughout the hole with local 2 m intervals of moderate carbonate alteration. Moderate silicification of clasts is present in the agglomeratic lapilli tuffs.

The High Grade vein was not intersected and a fault encountered near the top of the hole may have displaced the vein. Sparse quartz-carbonate veins with up to 5% pyrite were intersected but yielded no significant analyses.

EM87-5 (Figure 36)
The objective of EM87-5 was to test IP anomaly 'A' where it is coincident with the zone 1 (Au, Ag, Cu, Zn) soil geochemistry anomaly. A number of quartz veins are exposed by the Peak 200 roadcut near the EM87-5 setup and yielded analyses of up to 2.4 g/t Au (16207).

EM87-5 encountered a thick sequence of fine- to medium-grained tuff between the collar and 123.81 m depth.

Moderate carbonatization between 49.76 m and 123.81 m imparts a pale grey, bleached appearance to the tuff. Between 123.81 m and the end of the hole at 199.63 m, pyroxene porphyritic, agglomeratic lapilli tuff is the predominant rock type with minor (less than 5%) medium-grained tuff. Moderate quartz-carbonate-epidote alteration is present throughout the agglomeratic lapilli tuff; especially within the matrix.

Quartz-carbonate veins, 2 to 5 cm in width, are relatively abundant within the fine to medium-grained tuffs (2 to 5% of interval). The veins typically contain trace to 5% pyrite (rarely to 40%), trace chalcopyrite and trace to 1% hematite (rarely to 20%). Veins within this zone yielded the highest analytical results in EM87-5; up to 3.28 g/t Au over 7 cm.

A number of quartz veins cut the agglomeratic lapilli tuffs, however, geochemical results were not significant.

The coincident IP and soil geochemistry anomalies are correlative with the zone of abundant mineralized quartz-carbonate veins intersected near the top of the hole. The following sample highlights were obtained from veins within this zone:

Sample	Intervals (m)	Length (m)	Au ppb	Ag ppm	Cu ppm	Zn ppm	Other ppm
24698	33.51-33.66	0.15	123	5.0	420	98	
24699	34.82-34.89	0.07	3.28 g/t	1.1	81	43	
24701	38.39-38.49	0.10	560	3.0	871	36	
24702	39.19-39.39	0.20	370	0.8	36	47	237Pb

PEAK LAKE ZONE

EM87-6, 7 (Figure **37**)

The objective of EM87-6 and EM87-7 was to test the down-dip portions of a number of quartz veins sampled at surface. Grab samples of the veins collected during surface mapping, yielded analyses of up to 1.7 g/t Au, 12.9 ppm Ag and 1943 ppm Cu (16368).

The holes were collared in pyroxene porphyritic, agglomeratic lapilli tuff which apparently overlies a 15 m interval of steep southwest dipping, interbedded, fine- to medium-grained tuff and lapilli tuff. The fine tuffs in turn overlie pyroxene porphyritic, agglomeratic lapilli tuff which persists to the ends of the holes. A feldspar porphyritic dacite dyke with 5% fine disseminated pyrite was intersected near the bottom of EM87-6.

The agglomeratic intervals generally exhibit moderate to strong carbonate alteration with extensive zones of pervasive carbonatization. The fine tuffs exhibit weak to moderate carbonate alteration. Quartz and quartz-carbonate veins, 2 to 5 cm in width, comprise up to 5% of all units encountered in the drillholes. the veins typically contain 1 to 2% pyrite with rare concentrations to 50%. Sphalerite and chalcopyrite (trace to 3%) were noted in some veins. Gold content generally increases with sphalerite content.

With the exception of samples 24734 and 24801 which are in altered agglomeratic lapilli tuff, all significant analyses were returned from quartz vein samples. A summary of significant intersections follows:

EM87-6

Sample	Interval (m)	Length (m)	Au ppb	Ag ppm (except as noted)	Cu ppm	Zn ppm	Other ppm
23686	5.89- 5.96	0.07	102	1.6	116	83	
23689	10.00-10.05	0.05	405	7.2	411	247	219 Cr
23699	22.59-22.74	0.15	30	16.4 g/t	735	63	139 Pb 24 Sb
23712	29.15-29.27	0.12	200	76.4 g/t	228	1249	26.7 Cd 419 Pb
23725	40.84-40.94	0.10	54	18.5 g/t	53	164	27 Mo 236 Pb
23732	46.35-46.49	0.14	0.53 g/t	20.0 g/t	343	1001	380 Pb 417 As
23746	49.60-49.76	0.16	156	37.9 g/t	166	191	501 Pb
23771	64.97-65.04	0.07	17.8 g/t	316.0 g/t	0.263%	0.96%	2668 Pb 126 Sb
23773	65.14-65.29	0.15	19	4.6	128	0.43%	1807 Pb 54.7 Cd
23774	65.29-65.37	0.08	22	5.0	153	0.31%	3629 Pb 37.7 Cd

EM87-7

Sample	Interval (m)	Length (m)	Au ppb	Ag ppm (except as noted)	Cu ppm	Zn ppm	Other ppm
24734	6.58- 6.78	0.20	2.80 g/t	34.0 g/t	675	295	
24734	19.98-20.03	0.05	157	5.3	0.758%	228	
24753	34.40-34.52	0.12	62	114.5 g/t	339	532	786 Pb
24785	62.59-62.67	0.08	208	4.9	368	156	107 As
24801	79.40-79.96	0.56	24	1.5	94	0.34%	111 Pb
24804	81.02-81.21	0.19	182	6.5	132	75	

EM87-8, 9 (Figure 38)
The objective of EM87-8 and EM87-9 was to test IP anomaly I. In addition to the IP anomaly, a number of pyritic quartz veins and a pyritic dacite dyke outcrop in the vicinity of the drillholes.

Both holes encountered a generally fining downward sequence of volcaniclastic rocks ranging from fine-grained to cherty tuffs near surface to agglomeratic lapilli tuff and pyroxene porphyritic basalt at depth.

The volcaniclastic rocks are intruded by numerous feldspar porphyritic dacite dykes with ubiquitous 10% disseminated pyrite. The dykes are assumed to have steep westerly dips based on surface measurements though correlations between the drillholes do not necessarily corroborate this assumption. Near the bottom of the drillholes, the rocks abruptly change to fine-grained volcaniclastics and pyroxene porphyritic basalt. Correlations between the drillholes are tenuous due to the dacite intrusives which may parallel contacts between the volcaniclastics.

The drillholes exhibit abundant quartz veining, locally to 20%, at random orientations. The quartz veins contain from 5 to 20% pyrite. These veins in combination with the pyritic dacite intrusives are likely to be the source of IP anomaly I. Geochemical values returned from samples of the veins are generally low. A number of the veins are moderately enriched in molybdenum (up to 426 ppm Mo, sample 23927, EM87-8). These values are consistent with those obtained from veins exposed at the nearby Emma adit suggesting a fairly extensive vein stockwork.

EM87-10 (Figure **39**)

The objective of EM87-10 was to test IP anomaly J.

EM87-10 encountered alternating intervals, from 3 m to 20 m thick, of fine-grained tuff and agglomeratic lapilli tuff. The interval between 9 m and 30 m exhibits numerous zones of pervasive carbonatization in both the fine-grained and coarse-grained volcaniclastics. Quartz and carbonate veins are abundant within the carbonatized zones and contain from 2 to 10% pyrite. These zones are the likely source of IP anomaly J.

A 2 m, feldspar porphyritic dacite dyke separates fine-grained tuff from agglomeratic lapilli tuff near the bottom of the hole. The rocks in EM87-10 are considerably fresher in appearance than those in EM87-8 or EM87-9 due to the absence of intrusives (with the exception of the interval noted above) and structural disruptions.

The most significant analysis in EM87-10 was returned by a quartz vein sample; 145 ppb Au (24011). Geochemical values otherwise were generally low. A number of the quartz veins, however exhibited slight enrichment in molybdenum (up to 400 ppb Mo, sample 24046).

EM87-11 (Figure **40**)

The objective of EM87-11 was to test IP anomaly L which is coincident with a soil gold geochemistry anomaly outlined by previous workers.

Crystal lithic lapilli tuff is the predominant rock type in EM87-11 with lesser amounts of agglomeratic lapilli tuff. Four narrow (less than 1 m) feldspar porphyritic dacite dykes intrude the volcanics between 17 m and 60 m. Rocks within this interval generally contain

1 to 2% pyrite with concentrations to 10% in veins and in the intrusions. This pyritic interval is the probable source of IP anomaly L. None of the quartz veins sampled within this zone produced significant geochemical results.

The agglomeratic lapilli tuff in the bottom half of the hole is characterized by 2% pyrrhotite within vesicles. A 1 cm pyrrhotite vein in this zone yielded an assay of 0.252% Cu (24086). Also within this zone, a 1 cm quartz vein yielded 118 ppb Au, 16.8 g/t Ag, 0.69% Zn, 68 ppm Pb, and 227 ppm Ni (24090). None of the remaining samples in the lower portion of the hole yielded significant geochemical results.

A source for the soil gold geochemistry anomaly was not determined.

EM87-12 (Figure **41**)

The objective of EM87-12 was to test IP anomaly L with coincident anomalous soil gold geochemistry.

Pyroxene porphyritic, agglomeratic lapilli tuff exhibiting intense quartz-epidote alteration of the matrix was encountered through EM87-12. Pyrite and pyrrhotite are ubiquitous to 2%. The pyrrhotite occurs as blebs to 1 cm within the matrix and within quartz-rimmed amygdules. Pervasive carbonatization over 1 m intervals occurs sparingly down the hole. Quartz veins from 1 cm to 15 cm wide are present throughout and comprise up to 2% of the rock overall. Individual veins may contain up to 15% sphalerite, 5% chalcopyrite and 60% pyrite over various widths.

The ubiquitous pyrite and pyrrhotite is the probable source of the broad IP anomaly overlying EM87-12 while the mineralized quartz veins are the likely source of IP anomaly L and the anomalous soil gold geochemistry. Gold analyses from the quartz veins are encouraging and a summary of significant vein intersections follows:

Sample	Interval (m)	Length (m)	Au ppb	Ag ppm (except as noted)	Cu ppm	Zn ppm	Other ppm
24106	20.53-20.65	0.12	292	10.3 g/t	0.850%	0.60%	80 Pb 212 Sb
24117	36.20-36.32	0.12	44	38.0 g/t	1.315%	605	711 As
24122	38.69-38.90	0.21	90	58.3 g/t	0.429%	4.37%	585 Pb 1616.8 Cd
24124	39.12-39.39	0.27	148	2.6	666	1058	840 As
24127	39.97-40.12	0.15	240	53.7 g/t	0.570%	9.2%	567 Pb 455 As
24130	43.41-43.56	0.15	0.58 g/t	6.5	1051	1427	569 As
24141	58.93-59.22	0.29	0.65 g/t	2.3 g/t	438	170	1466 As
24652	91.18-91.24	0.06	0.81 g/t	1.9	111	540	

5.5.3 Discussion

The 1987 diamond drilling program largely confirms the results of surface mapping in the High Grade and Peak Lake zones.

The High Grade zone is characterized by abrupt changes in lithologies which include pyroxene porphyritic agglomeratic lapilli tuff, flow breccia, lapilli tuff, medium- to fine-grained tuff and cherty tuff. Contacts between the various lithologies are both conformably and structurally related. Finely disseminated pyrite is present throughout the zone in trace amounts or greater. Carbonate, quartz and epidote alteration affects the rocks to various degrees.

Quartz veins are numerous in the High Grade zone and most contain 2 to 3% pyrite. Generally, only those veins with greater than or equal to 15% total sulphides produced gold assays in excess of 1 g/t Au. Silver values, similarly, increase with sulphide content.

The correlation between gold and zinc for veins intersected by drilling in the High Grade zone is not as strong as the correlation noted during surface sampling of the High Grade vein. Therefore, gold may occur in correlation with other sulphide minerals aside from sphalerite and zinc may not be a valid exploration parameter when looking for gold in the High Grade zone.

Although several samples of veins in drill core produced highly anomalous gold assays, 3.28 g/t Au over 0.07 m for sample 24699 in EM87-5 for example, none produced assays approaching those of the High Grade vein. The results of the 1987 drilling program in the High Grade zone therefore suggest that the High Grade vein may be an isolated occurrence.

The Peak Lake zone is again characterized by abrupt changes in lithologies which range from agglomeratic lapilli tuffs to cherty tuffs. In addition, a considerable number of feldspar porphyritic dacite intrusions were intersected.

Alteration within the Peak Lake zone is stronger and more widespread than alteration within the High Grade zone. Silicification is strongest in proximity to the dacite intrusions where quartz veins comprise up to 20% of the rock. These quartz veins typically contain between 5 and 20% pyrite and are frequently enriched in molybdenum. EM87-12 was drilled entirely within agglomeratic lapilli tuff exhibiting intense quartz-epidote flooding of the matrix. Quartz veins are abundant and samples of the veins produced a number of significant gold and silver assays including 0.81 g/t Au over 0.06 m, sample 24652 and 58.3 g/t Ag over 0.21 m, sample 24122. The intense quartz-epidote alteration may be related to the Peak Lake fault or one of its splays. Extensive zones of pervasive carbonatization encountered in EM87-6 and EM87-7 appear also to be related to the Peak Lake fault. Quartz veins cutting the carbonatized zones produced some of the highest assays from the drill core including 17.8 g/t Au with 316.0 g/t Ag over 0.07 m, sample 23771.

The correlation between gold and zinc values in the Peak Lake zone is relatively strong. Base and precious metal concentrations appear to increase with alteration which in turn increases with proximity to the Peak Lake fault. Based on the high degree of alteration and the numerous anomalous values obtained from drill core, the Peak Lake zone represents a favourable area for future exploration.

6.0 PROPOSED WORK PROGRAM

6.1 PLAN

The following program is designed to follow-up the results of the 1987-88 exploration program. Attention is to be focussed on each of the mineralized zones as discussed in section 5.

High Grade Zone
Intermediate lines are to be established and soil samples collected over zone 1, 2a and 2b soil geochemistry anomalies to better define anomaly patterns and to confirm anomaly continuity. Additional detailed geological mapping and rock sampling is required to identify the source of the soil geochemistry anomalies.

Peak Lake Zone
A compassed and flagged grid is to be established to cover the area enclosed within the Emma 1 through 5 and Emma 9 claims. A 100 m line spacing is recommended with 25 m station intervals. Soil samples are to be collected at the sample stations and analysed for gold and by ICP. This would confirm the results of the previous soil survey and provide values for additional elements not previously available.

Induced polarization surveying is recommended to extend coverage west to the property boundary and to provide coverage of the Peak Lake fault.

An additional 500 m of diamond drilling is required to test known soil geochemistry anomalies and to further evaluate mineralization associated with the Peak Lake fault.

Detailed geological mapping is required to better understand controls on mineralization and gold emplacement within the zone.

CM-240 Zone

A compassed and flagged grid is to be established over the CM-240 zone. A line spacing of 100 m is recommended with a station interval of 25 m. This grid can be tied in to the High Grade zone grid at 6+00W. A soil sample is to be collected at each station and analysed for gold and by ICP. Detailed geological mapping of the area is also recommended. Contingent upon favourable results from mapping and soil sampling, induced polarization surveying is recommended to identify zones warranting diamond drilling.

Debeaux Creek and Kammat Creek Zones

These creeks follow the surface trace of a northeast trending fault. Initially, a soil sampling grid is to be established over the fault structure with a line spacing of 200 m and station intervals of 25 m. Grid lines should extend to 500 m on either side of the fault. As results from the soil geochemistry survey become available, fill-in lines over anomalous zones are recommended.

Detailed geological mapping is required over both zones to understand and evaluate structural controls on mineralization and alteration.

Contingent upon encouraging results from mapping and sampling, induced polarization surveying is recommended to define drill targets.

Cost estimates for the proposed exploration program are given in Section 6.2.

6.2 BUDGET

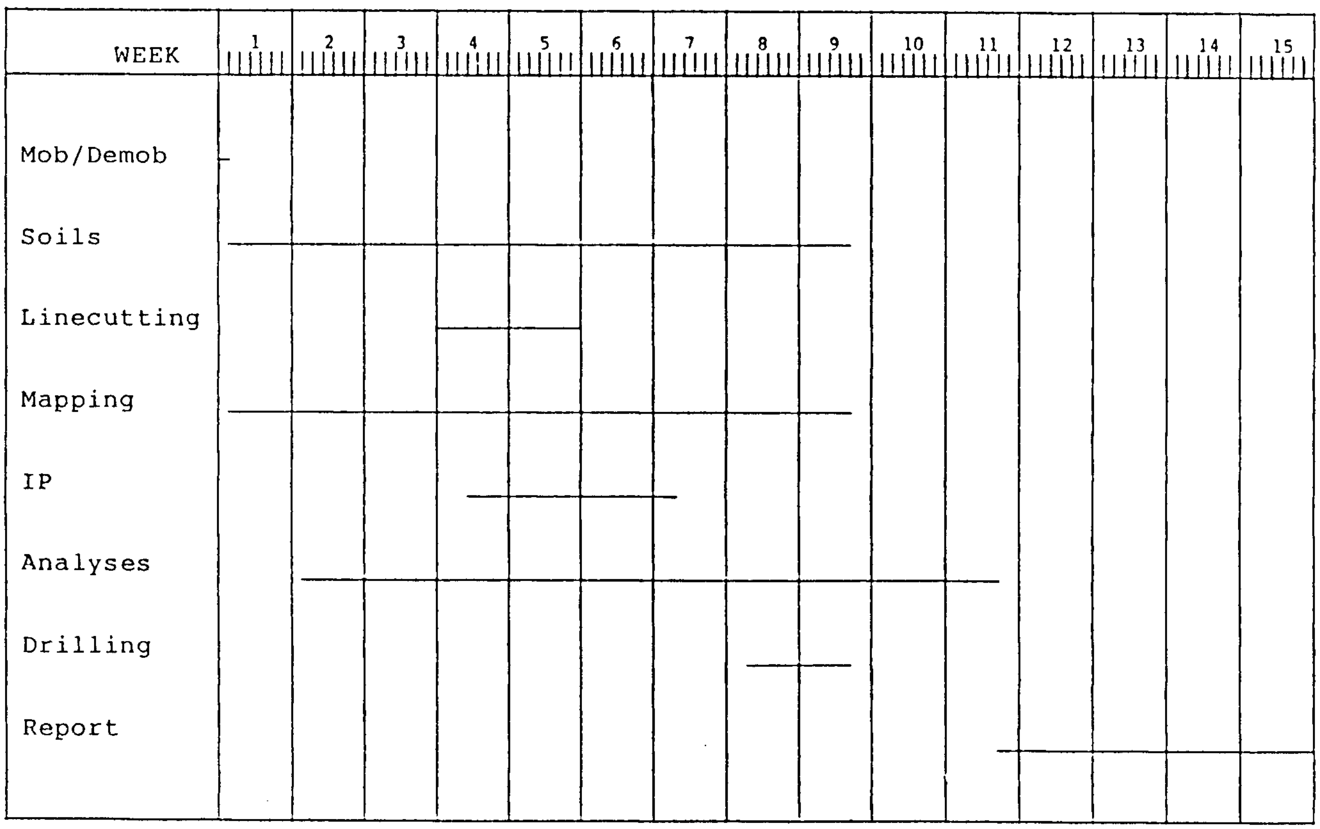
Mobilization/Demobilization	$ 2,000
Personnel	90,675
Support Costs	22,232
Transportation, Communication, Supplies	22,990
Equipment Rental	7,700
Contract Services - Drilling	40,000
Analyses	46,664
Report Preparation	21,850
Administration @ 15%	14,815
Contingency @ 15%	40,339
Total Cost, say,	**$310,000**

6.3 SCHEDULE

The following schedule illustrates the time requirements for the proposed program.

Table IV

SCHEDULE



7.0 CONCLUSIONS

1. The Emma property is predominantly underlain by Upper Paleozoic Sicker Group (Myra Formation?) agglomeratic lapilli tuff, lapilli tuff, fine- to medium-grained tuff, cherty tuff, chert and minor pillow basalt with lesser Triassic Vancouver Group pillow basalt and Cretaceous Nanaimo Group conglomerate.

2. Five zones of significant mineralization and/or alteration were outlined with potential to host economic mineral deposits.

   a) The High Grade vein appears to be an isolated occurrence within a zone of extensive quartz veining but generally low lithogeochemical values. Highly anomalous soil geochemistry, however, suggests that more exploration is warranted in this area.

   b) The Peak Lake zone exhibits extensive alteration and highly anomalous lithogeochemistry and warrants considerable additional exploration.

   c) The CM-240 zone has the potential to host a structurally controlled vein hosted deposit based on initial rock sampling. Further exploration is warranted in this area.

   d) The Debeaux Creek zone exhibits widespread structurally controlled alteration, and warrants further exploration.

e) The Kammat Creek zone is characterized by well-mineralized chert and jasper horizons with anomalous lithogeochemistry. Again, more exploration in this area is warranted.

3. Structurally controlled, vein hosted deposits are the most viable exploration targets on the Emma property.

4. Four zones of anomalous soil geochemistry were outlined by the 1987 exploration program. Zones 1 (High Grade zone), 2a and 2b represent the most favourable exploration targets based on relatively strong metal enrichment in these zones and their persistence over significant strike lengths. Soil geochemistry surveys in the Peak Lake, CM-240, Debeaux Creek and Kammat Creek zones are warranted.

5. The induced polarization survey outlined a number of anomalous zones. Surface mapping and diamond drilling determined that most if not all of the IP anomalies are caused by various amounts of disseminated sulphides (principally pyrite). Additional IP surveying is warranted in the Peak Lake zone to provide coverage of the Peak Lake fault and the associated alteration zone.

6. The Emma property has a high potential to host a structurally controlled vein deposit similar to the neighbouring Debbie property based on similar geology, alteration and structural controls.

7. A work program consisting of geological mapping and rock sampling, soil geochemistry surveying, induced polarization surveying and diamond drilling is recommended at an estimated cost of $310,000.

8.0 RECOMMENDATIONS

High Grade Zone ($10,000)

1. Additional soil sampling at 50 m line spacing over zones 1, 2a and 2b is recommended.

2. Detailed mapping and sampling with an emphasis on structural detail is recommended.

Peak Lake Zone ($100,000)

1. A soil geochemistry survey covering the Peak Lake zone between the western and eastern claim boundaries is recommended.

2. Additional IP surveying to provide coverage up to the western claim boundary is recommended.

3. Additional diamond drilling is recommended to more fully explore the Peak Lake fault and associated alteration.

4. Detailed mapping and sampling with an emphasis on structural detail is recommended.

CM-240 Zone ($50,000)

1. A soil geochemistry survey to provide coverage of the fault structure which cuts the zone is recommended.

2. Detailed structural and lithological mapping and rock sampling is recommended.

3. If warranted by points 1 and 2, IP surveys are recommended over anomalous areas.

Debeaux Creek, Kammat Creek Zones ($150,000)

1. Soil geochemistry surveys are recommended in both zones.

2. Additional geological mapping and sampling is recommended.

3. IP surveys are recommended over anomalous areas.

The work program outlined above is recommended at an estimated cost of $310,000.

Respectfully submitted,

MPH CONSULTING LIMITED

G.R. Cope, B.Sc.

Vancouver, B.C.
February 29, 1988

CERTIFICATE

I, G. Cope, do hereby certify:

1. That I presently hold the position of Project Manager/ Geologist with MPH Consulting Limited.

2. That I am a graduate in geology of the University of British Columbia (B.Sc. 1985).

3. That I have worked in mineral exploration since 1981 and have practiced my profession as a geologist since 1985.

4. That I am an associate member of the Geological Association of Canada.

5. That the opinions, conclusions and recommendations contained herein are based on field work carried out on the property from June 25, 1987 to February 28, 1988 and supervised by me.

6. That I own no direct, indirect, or contingent interests in the subject property, or shares or securities of Au Resources Ltd.

G.R. Cope, B.Sc.

Vancouver, B.C.
February 29, 1988