Kamaka Resources Ltd.
6074, 45A Avenue, Delta B.C. Canada. V4K 1M7 Phone: (604) 940-1591

PROSPECTING, GEOLOGICAL AND PETROLOGICAL ASSESSMENT REPORT

ON THE

KNOB HILL CLAIM GROUP

NORTH VANCOUVER ISLAND, BRITISH COLUMBIA

NTS: 102 I/16

Latitude: 50° 46' N
Longitude: 128° 03' W

For

Kamaka Resources Ltd
6074, 45 A Avenue,
Delta, B.C.
V4K 1M7

By

P. Dasler, P.Geo.

February , 1994

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SUMMARY

During the summer of 1993 three exploration programmes were carried out on the Fox group of claims. On each programme rock samples were collected and reconnaissance prospecting was carried out. Four samples were submitted for petrological studies and one was assayed for copper, gold and trace elements.

The exploration work was carried out as day prospecting trips from a base out of Port Hardy. The prospecting programmes included panning for heavy mineral samples and visual gold, detailing of the geology, and sampling of mineralized zones. A suite of rock samples was collected and petrological work was carried out to determine mineralogy and alteration styles.

The results of this sampling and mapping are detailed in the following report, which also outlines the regional geology of northern Vancouver

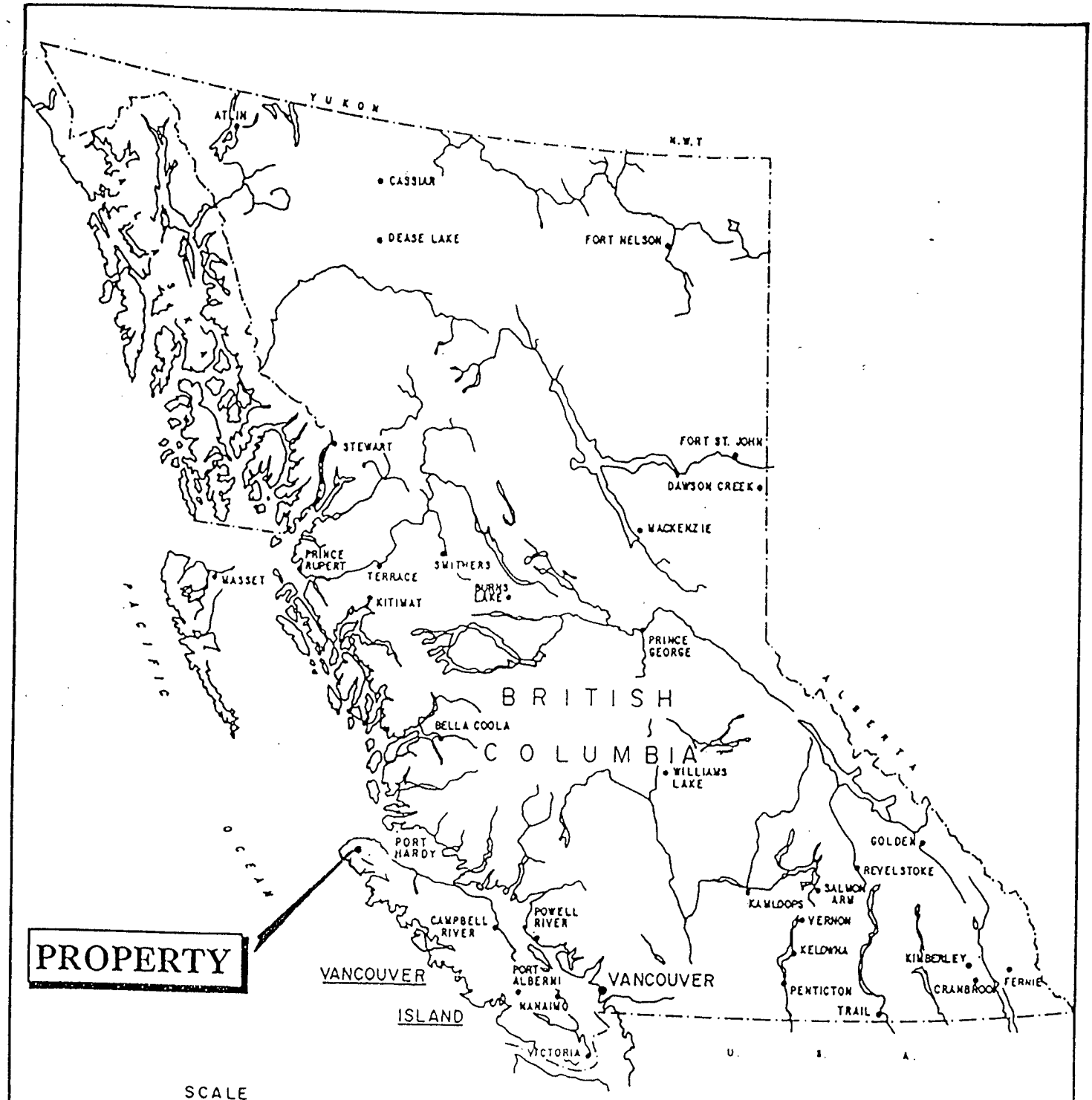
There has been no previous exploration for gold in this area, although dredges are reported to have operated on the northwest coast at the turn of the century. The two most significant drainages in this area, the Stranby, and Nahwitti rivers have placer gold at their mouths. The Knob Hill area is a credible source for this gold.

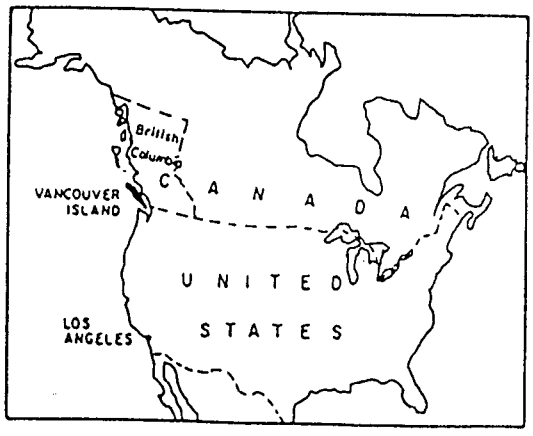
This report details expenditures of $ 2,673.94 to be applied against assessment for the property.

INTRODUCTION

The Bonanza volcanic rocks north of Holberg Inlet on northern Vancouver Island host the 55,000 tpd Island Copper mine. They also host the large Hushamu copper-gold deposit (over 191 million tons, 0.30 Cu, 0.010 opt Au), and the Hep and Red Dog porphyry copper deposits. Since 1980, and particularly since 1990, the siliceous alteration caps overlying these porphyry deposits have been shown to contain significant gold mineralization.

In early April 1993 a short reconnaissance of the north-eastern portion of the Knob Hill property was carried out to find the location of rocks mapped by Chevron geologists as "altered rhyolites". In June a full day was spent on the claims collecting samples from the scattered outcrops, and from drill core left on the property by Chevron in 1976.



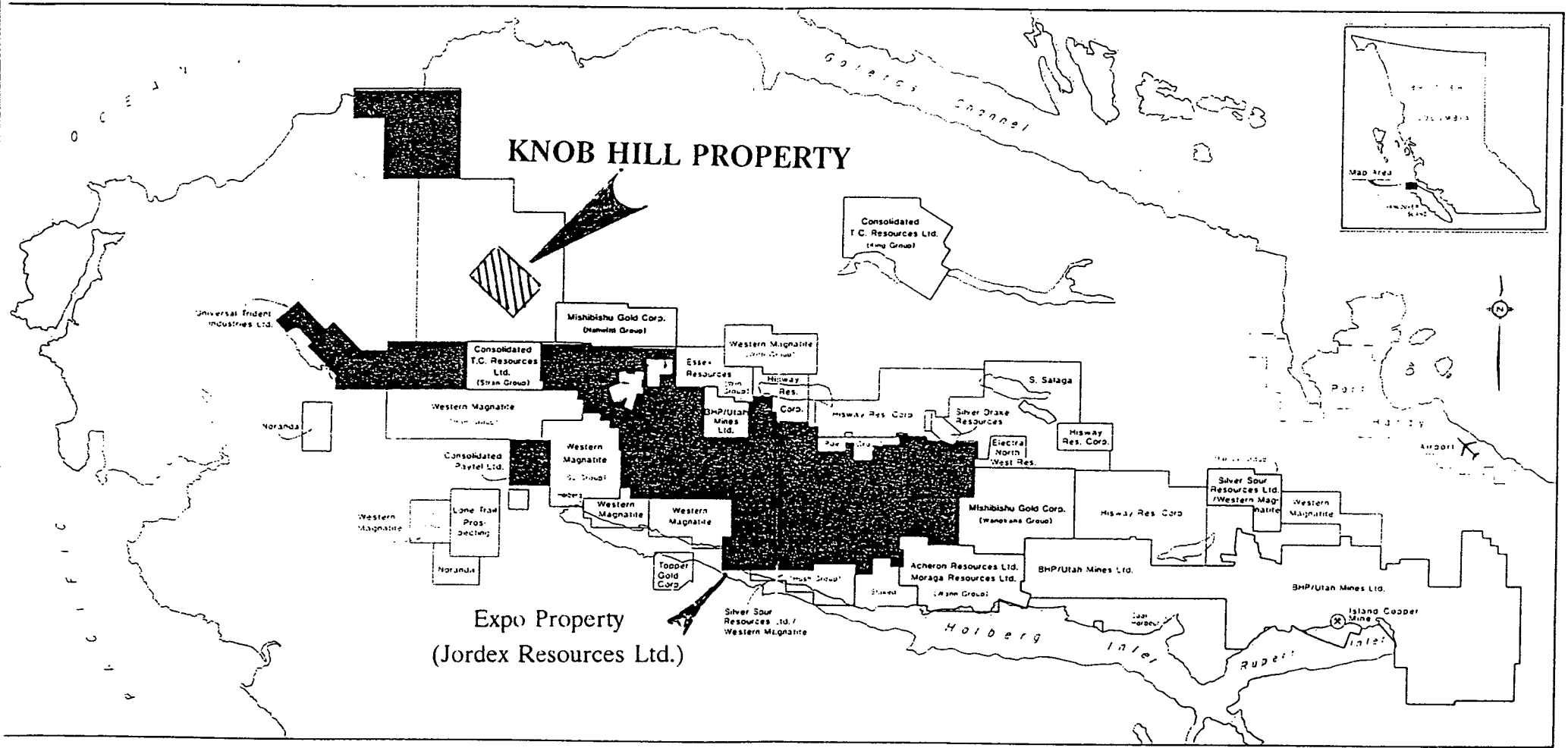


KNOB HILL PROPERTY

LOCATION MAP

KAMAKA RESOURCES LTD.

Scale: 1:50,000 | Date: FEB. 1994



PORPHYRY COPPER - GOLD BELT

NORTHERN VANCOUVER ISLAND, BRITISH COLUMBIA

Scale in Kilometres

0 5 10

KNOB HILL LOCATION MAP

In July a further trip was made to the property to review the drill core, the location of the known copper and gold geochemical anomalies, and the to test soil depths in the vicinity of these soil anomalies. The soil testing was carried out on meandering traverses across the southeast side of Knob Hill using a 1.2 metre dutch open soil auger.

This report details the known geology of the claim area, and provides maps and sample descriptions for future work programs. The soil augering was used to ascertain wheater a further programme of soil sampling should be carried out, or whether basal till sampling should be used.

LOCATION, ACCESS AND TOPOGRAPHY

The Knob Hill property is located 45km west of Port Hardy on northern Vancouver Island, within N.T.S. map-sheet 102 I/16.

The claim area is accessible by helicopter or a long cross-country trek. For each of the surveys described we reached the property using a helicopter chartered from Vancouver Island Helicopters Ltd. at Port Hardy.

PROPERTY

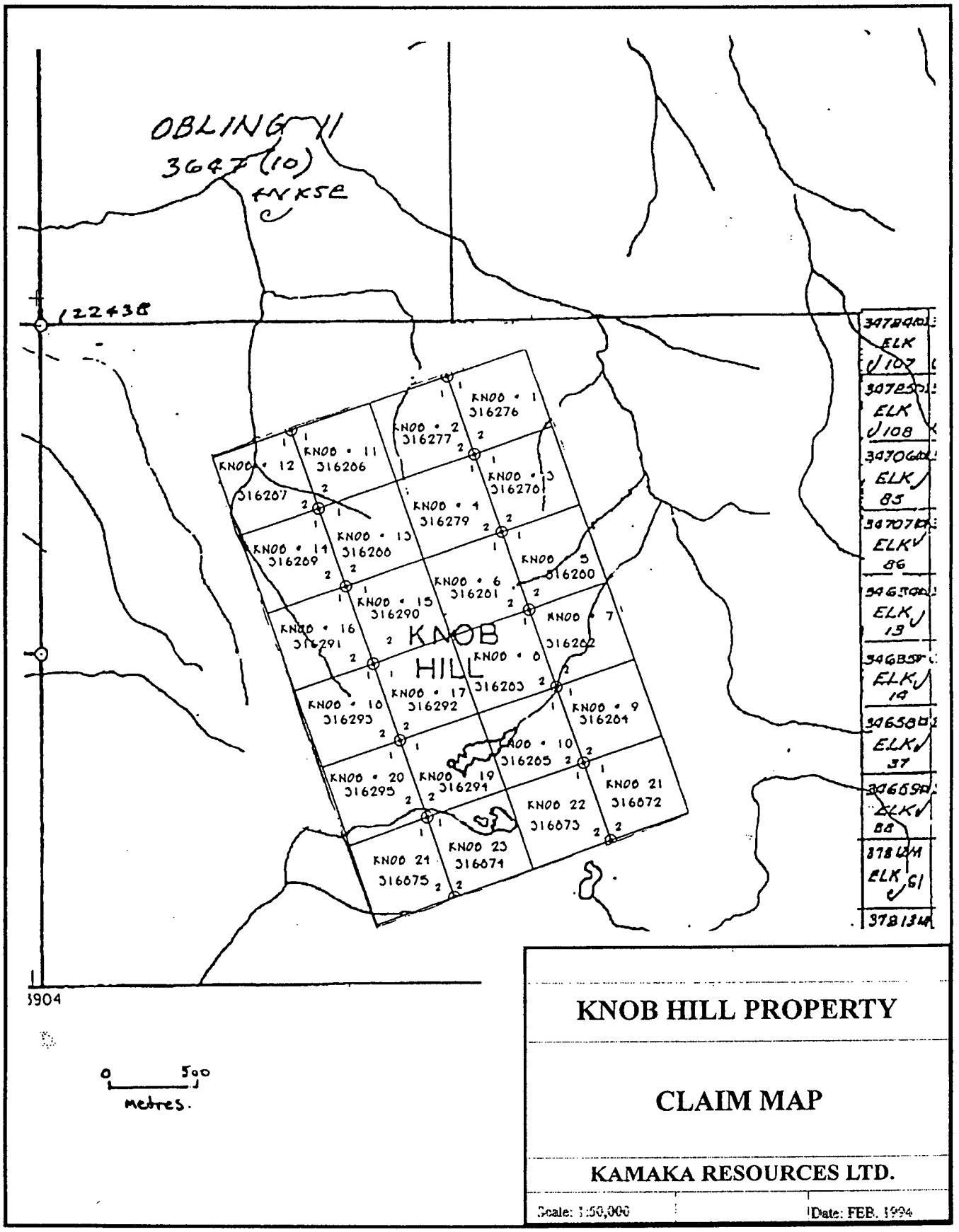
The property consists of the following contiguous claims located within the Nanaimo Mining Division. The claims are shown on figure 2:

Name	Tenure No.	Units	Expiry	Recorded Owner
Knob 1-20	316276-95	20	15 Feb 1994	Peter Dasler
Knob 21-24	316872-75	4	1 April 1994	Peter Dasler

One year of assessment is being applied with this report.

HISTORY

The area now covered by the Knob claims has been under mineral tenure since 1972. The first significant work programmes on the property were carried out by Chevron Standard Limited in 1974 and 1975. The claims had been staked following the discovery of the Island Copper mine in 1968, with the realization that further large-scale alteration existed within the belt of Bonanza



KNOB HILL PROPERTY

CLAIM MAP

KAMAKA RESOURCES LTD.

Scale: 1:50,000 | Date: FEB. 1994

volcanic rocks that trended northwest from the mine. Chevron carried out geological mapping, basal till samlpling, and overburden drilling, magnetometer surveys, limited IP, and drilled a total of four diamond drill holes in 1972 (3177 ft), and five diamond drill holes in 1976 (total 1989 ft AQ core).

The Knob hill property is on the western end of the belt. BHP Minerals Canada Ltd. control the majority of the eastern end of the copper belt, with claims that date back to the mid 1960's.

The mineral claims reverted to Messrs Veerman and Botel as Chevron pulled out of mineral exploration, and in 1980 Teck Corporation carried out a small magnetometer survey and drilled three short holes (118ft, 90ft, 62 ft). Sub-economic copper mineralization in chlorite-magnetite altered volcanics was intercepted.

In 1989 Placer Dome staked the property following a regional reconnaissance programme. Placer staked the property, because of high concentrations of gold in the creeks draining the area (eg. Oblong Creek - 50 gold colours).

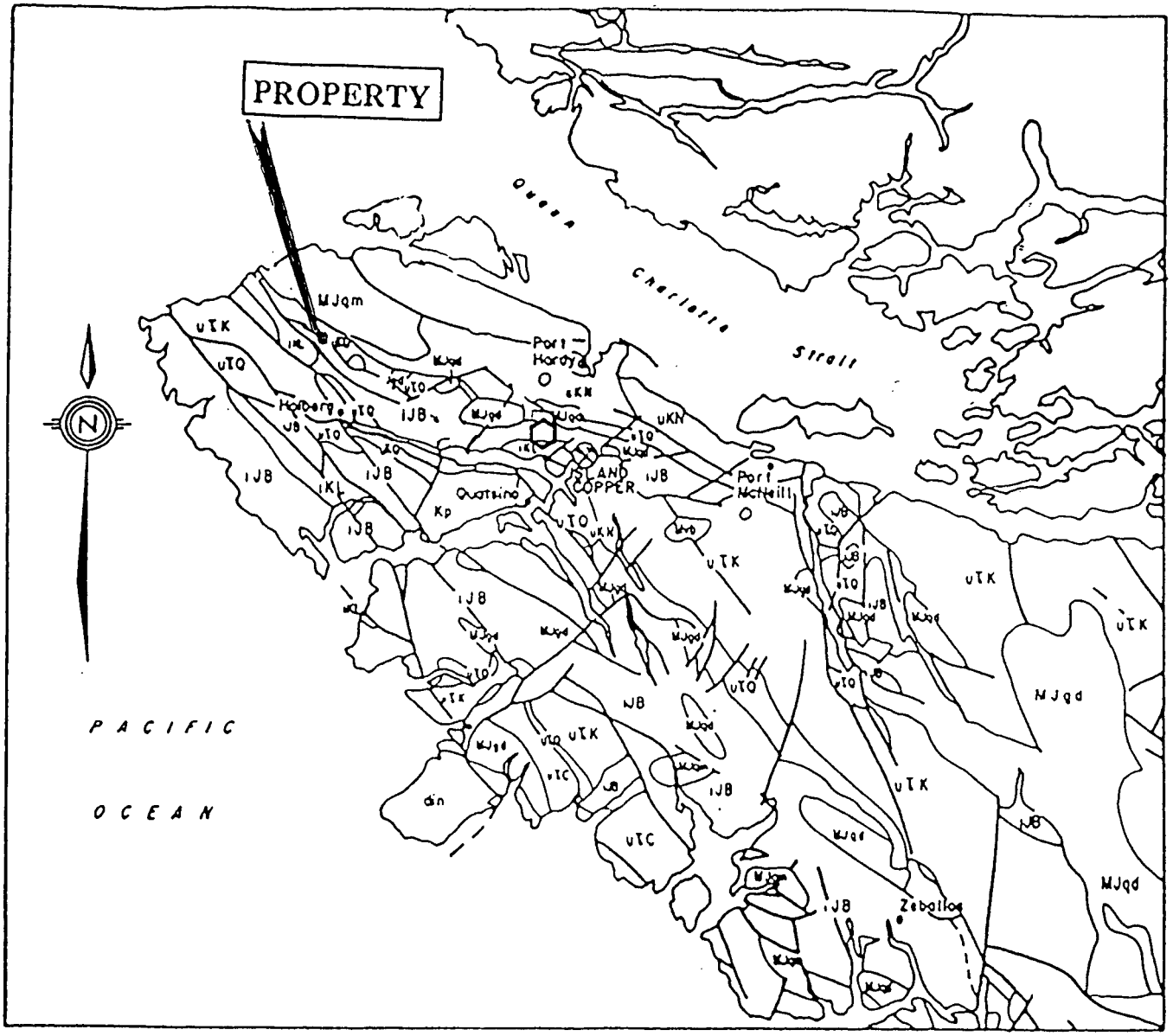
Placer conducted a very limited programme on the claims in the three years they held them. Two reconnaissance soil sample lines of two kilometre length were carried out northeast of Knob Hill, along with some reconnaissance mapping. The gold from the reconnaissance sampling programme was also microprobed to determine its source.

The current claims were staked by Kamaka Resources Ltd to cover the previously recognised copper anomalies (Chevron 1975), and a coincident area of NW trending magnetics anomalies. The gold anomalies identified by Placer Dome (150, 105 ppb Au) are adjacent to the copper rich zone south of Knob Hill. An arsenic anomaly (100 ppm) was also identified by Placer Dome in this area.

REGIONAL GEOLOGY

Vancouver Island north of Holberg and Rupert inlets is underlain by rocks of the Vancouver Group. These rocks range in age from Upper Triassic to Lower Jurassic. They are intruded by rocks of Jurassic and Tertiary age and disconformably overlain by Cretaceous sedimentary rocks. Figure 3 is a 1:1,000,000 geological map of the northern part of the island.

Faulting is prevalent in the area. Large-scale block faults with hundreds to thousands of metres of displacement are offset by younger strike-slip faults with displacements up to 750 metres (2,500 feet).



LEGEND

MIOCENE
- Mvb basalt flows,sills and dykes

UPPER CRETACEOUS, PALEOCENE,EOCENE
- Kp QUEEN CHARLOTTE GROUP: siltstone,shale,greywacke

UPPER CRETACEOUS
- uKN NANAIMO GROUP: sandstone,shale,conglomerate

LOWER CRETACEOUS
- iKL LONGARM:greywacke,conglomerate

JURASSIC
- Jgd granodiorite,quartz diorite

MIDDLE JURASSIC
- MJqm quartz monzonite,granite,monzonite
- MJgd granodiorite
- MJqd quartz diorite

LOWER JURASSIC
- lJB BONANZA:andesite,dacite,rhyolite

UPPER TRIASSIC
- uTQ QUATSINO and PARSON BAY: limestone,argillite
- uTK KARMUTSEN:basalt, pillow lava

AFTER MULLER et al (1974)

SCALE

0 25 50

kilometers

KNOB HILL PROPERTY

REGIONAL GEOLOGY

KAMAKA RESOURCES LTD.

Scale: As Shown | Date: FEB. 1994

The Vancouver Group is described as follows (Muller, 1974):

(a) Basal Sediment - Sill Unit: Middle and Upper Triassic Age
(b) Karmutsen Formation: Upper Triassic Age
(c) Quatsino Formation: Upper Triassic Age
(d) Parson Bay Formation: Upper Triassic Age
(e) Harbledown Formation: Lower Jurassic Age
(f) Bonanza Formation: Lower Jurassic Age

Cretaceous Sediments

The Vancouver Group is unconformably overlain by non-marine Cretaceous sediments of the Longarm Formation which are estimated to be about 300 metres (1,000 feet) thick in the Port Hardy area.

Intrusive Rocks

The Vancouver Group rocks are intruded by a number of Jurassic-aged stocks and batholiths. In the Holberg Inlet area a belt of northwest-trending stocks extend from the eastern end of Rupert Inlet to the mouth of Stranby River on the north coast of Vancouver Island (Carson, D.J.T., 1972).

Quartz-feldspar porphyry dykes and irregular bodies occur along the south edge of the belt of stocks. At the Island Copper Mine, these porphyries are enveloped by altered, brecciated, mineralized Bonanza wallrocks. The porphyries are also cut by quartz veins, pyritized, extensively altered and are mineralized where they have been brecciated. The quartz-feldspar porphyries are thought to be differentiates of Middle Jurassic felsic, intrusive rocks.

Structure

The structure of the rocks north of Holberg and Rupert inlets is that of shallow synclinal folds along a northwesterly fold axes. The steeper southwesterly limbs of the folds have apparently been truncated by faults roughly parallel to the fold axes. Failure of limestone during folding may have influenced the location of some of the faulting as indicated by the proximity of the Dawson and Stranby River faults to the Quatsino Formation. Transverse faulting is pronounced and manifested by numerous north and northeasterly trending faults and topographic lineaments.

The northern part of Vancouver Island lies in a block faulted structural setting with post Lower Cretaceous northwesterly trending faults apparently being the major system. This system causes

both repetition and loss of parts of the stratigraphic section, with aggregate movement in a vertical sense in the order of tens to hundreds of metres. The most significant of these fault systems trends west to northwest following Rupert and Holberg inlets. Near the western end of Holberg Inlet this fault splits, with the main branch following Holberg Inlet and the other branch passing through the west side of the Stranby River valley. Another northwesterly to westerly system passes through William Lake and other, smaller systems pass through Nahwitti Lake and Georgie Lake.

Northeasterly trending faults comprise a subordinate fault system. In some cases, apparent lateral displacement in the order of several hundred metres can be measured on certain horizons. Movement, however, could be entirely vertical with the apparent offset resulting from the regional dip of the beds. A strong northeasterly trending system passes through the Goodspeed River valley and Lake of the Mountains.

Recent computer modelling of the airborne magnetometer data has provided a clear understanding of the relationship of secondary conjugate sets of northeast and north westerly faults related to the major west-northwest trending breaks. These conjugate fault sets appear to relate directly to the significant mineralization at the Island Copper, Hushamu, Hep and Red Dog copper/gold deposits. There are strong northwest and northeast magnetic and topographic features crossing the Knob Hill property.

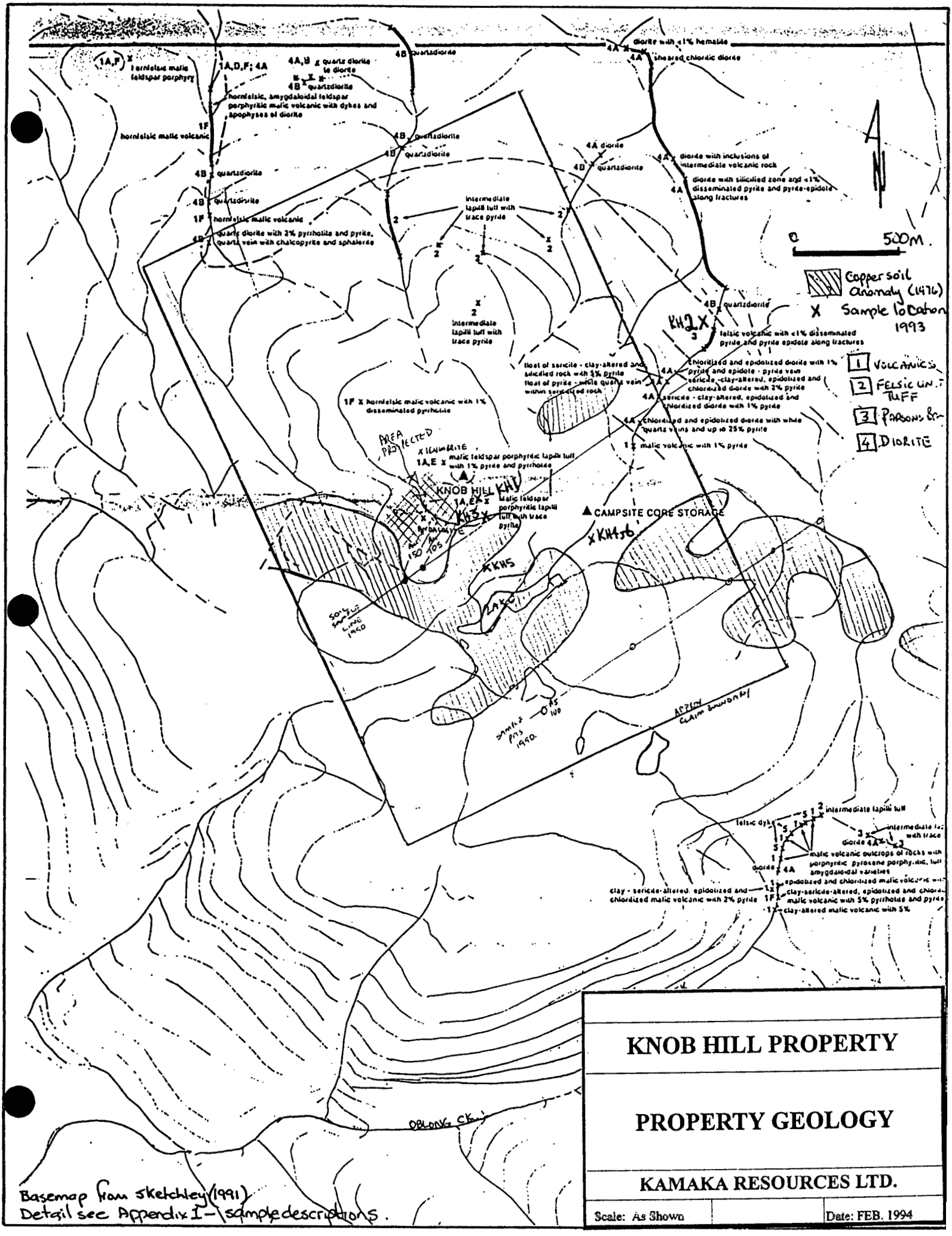
Generally, the regional dip of the bedding is gentle to moderate southwesterly. West of Holberg dips are locally much steeper in close proximity to major faults. There is little folding or flexuring of bedding visible, except along loci of major faults where it is particularly conspicuous in thinly bedded sediments of lower Bonanza Formation. Bedding is generally inconspicuous in massive beds of Karmutsen, Quatsino and Bonanza formation rocks, particularly inland where outcrops are widely scattered.

REGIONAL MINERALIZATION

A number of types of mineral occurrences are known on northern Vancouver Island. These include:

1. Skarn deposits: copper-iron and lead-zinc skarns;

2. Copper in mafic volcanic rocks (Karmutsen Formation): in amygdules, fractures, small shears and quartz-carbonate veins, with no apparent relationship to intrusive activity;



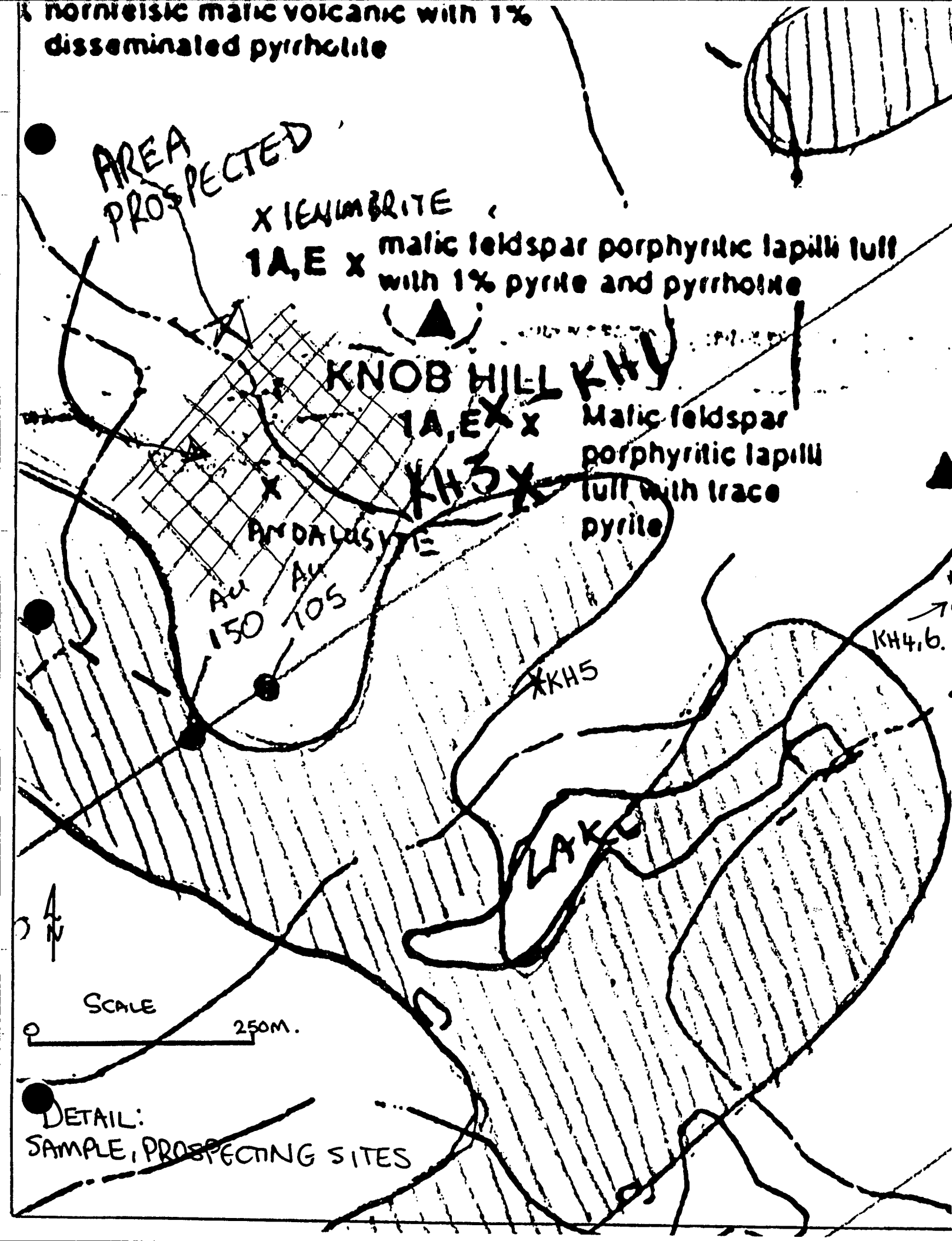
Basemap from Sketchley (1991)
Detail see Appendix I - sample descriptions.

KNOB HILL PROPERTY

PROPERTY GEOLOGY

KAMAKA RESOURCES LTD.

Scale: As Shown		Date: FEB. 1994


hornfelsic mafic volcanic with 1% disseminated pyrrhotite
AREA PROSPECTED
X IGNIMBRITE
1A,E X
malic feldspar porphyritic lapilli tuff with 1% pyrite and pyrrhotite
KNOB HILL
1A,E X
X
Malic feldspar porphyritic lapilli tuff with trace pyrite
KH3
ANDALUSITE
Au 150
Au 105
KH4,6.
KH5
LAKE
N
SCALE
250M.
DETAIL:
SAMPLE, PROSPECTING SITES

3. Veins: with gold and/or base metal sulphides, related to intrusive rocks;

4. Porphyry copper deposits: largely in the country rock surrounding or enveloping granitic rocks and their porphyritic phases.

Utah Mines Ltd., in their many years of exploration in the region of Holberg and Rupert inlets, focused their attention on the search for porphyry copper deposits. Their exploration resulted in the location and development of the Island Copper Mine. They also located other areas of porphyry mineralization, as well as two areas with anomalous gold concentrations and one area with massive sulphide (replacement) mineralization within their properties.

PROPERTY GEOLOGY AND MINERALIZATION

The whole Knob Hill area forms a gently rolling plateau at 400-500 metres elevation, only locally bush covered, but mainly marked by small ponds and swamps. Generally there is little outcrop in the area, but frost boils provide numerous indications of shallow subcrop. An extensive basal till drilling and sampling programme was carried out by Chevron in 1972. Samples from this were assayed for copper, molybdenum and zinc. Extensive statistical evaluation was carried out, and conventional soil sampling was compared with the results (favourably).

Chevron's work identified a very large area with anomalous copper mineralization. The wide spaced sampling (300 foot spaced samples on 800 foot spaced lines) identified a zone approximately 5 km by 1 km that has values generally over 200 ppm copper. Within the broad zone (which may be two zones offset by a NE trending structure) are two areas which have anomalous values of 800-1100 ppm copper. These zones trend E-W across the Knob Hill property.

The Knob Hill area is also recognized as being on the south side of a strongly deformed 4000 gamma airborne magnetics anomaly. Locally there appears to be significant offset of the geology because of a NE trending structure. This also shows up as offsets in the regional geophysics. There is strong silicification in the volcanics and in the (Parsons Bay) sediments (mapped as rhyolite). Pyrrhotite is very common in the altered rocks, along with pyrite, and some chalcopyrite and sphalerite.

To the north there is a large granodiorite-quartz diorite of the Island Intrusive suite. The narrow belt of "rhyolite" parallels the southern edge of the intrusive, and further south the scattered

outcrop and subcrop indicate a 2-3 km wide zone of volcanics. This geology appears to be a continuation of the Bonanza Volcanic belt which is well recognised to the east.

There are twelve drill sites scattered across the property. The holes (AQ) are from 20 to 150 metres deep. From the drill core there is ample evidence for a porphyry environment similar to Island Copper or Hushamu. This can be seen from the extensive pyritization and zones of strong magnetite-chlorite-biotite alteration. Significant copper mineralization was only recorded by Chevron from hole 72-1 (80 feet of 0.10% Cu incl 10 feet of 0.2% Cu. The reports print an erroreous picture however as the author, and staff geologists from BHP Minerals, inspected the unsplit core from Chevron's 1976 drill programme and noted further, widespread, low grade chalcopyrite mineralization.

Coarse calcite-arsenopyrite veining was noted in one hole from the 1972 programme. This arsenopyrite was assayed by Placer geologists in 1990, and was shown to contain elevated gold values, (7200 ppm As, 410 ppb Au). The author noted this arsenopyrite, and further arsenopyrite veining in the 1976 core. Unfortunately weathering of the core and boxes has obliterated the majority of the hole numbering and footage markers. A suite of core samples was collected for later microscope work, and two samples (KH4 and KH6) were submitted for petrological work reported in this report.

Mapping by the Chevron geologists showed that there is significantly more quartz veining in the volcanics on the property than is recognised elsewhere in the belt. The author has had extensive experience mapping and supervising exploration on other properties to the east of Knob Hill, all the way east to Island Copper. It is very rare to see quartz veining in the Bonanza volcanics. Although the author has not visited the mapped sites, it is postulated that the increased quartz veining was caused by regional hornfelsing caused by the large intrusive body mapped to the north of the Knob Hill property. This hornfelsing may be a significant event in relation to the increased gold values in the area.

Exploration target:

The most obvious exploration target on the property is the strong geochemical anomaly (200 ppm-400 ppm Cu), which trends NW-SE across the south side of Knob Hill. The rocks in this area show strong biotite-chlorite-magnetite alteration, typical of the other porphyry copper targets in the belt. This first target area has two zones of 1,200 metres X 400 metres within a broad area approximately 5000 metres X 1000 metres in extent.

The exploration work by Placer focussed on the gold dispersion in Oblong creek. This creek drains the southeastern side of the Knob Hill area, and some lowlying ground to the east. Placer's field crew identified a moss mat sample from the creek which contained 30-50 gold colours (pers comm, D. Sketchley). Further work was performed following the original discovery, and the gold mineralization was found to occur through to the headwaters of the creek. Microprobe analyses of the gold particles showed both a copper and a mercury rich gold, indication both a deep porphyry environment, and a high level epithermal environment. In August 1993 the author resampled the lower levels of Oblong creek, and obtained samples containing from 1-7 colours of gold in 10 different pannings of stream sediments. In the first sample there were six small gold particles (specks) and one 0.75 mm flat flake. These samples have been kept for possible later analyses. Further panning was attempted on the property during the seconds property visit, however high water precluded sampling satisfactory sediment accumulations, and it was decided to leave the panning until a later date.

The level of gold mineralization noted in the drainages from the property is not recognised in drainages elsewhere in the belt. Oblong creek drains into the Stranby river, which was dredged for gold at its mouth, some 10 km northwest. To the north of Knob Hill the Nahwitti river was also dredged for gold at the turn of the century. The Knob Hill property is partially underlain by what appears to be high level acid-sulphate altered rocks (see " ignimbrite" location SE side of trig point) Figure 4. To the east there is strong acid sulphate alteraton on the NW Expo property, and surrounding the Red Dog property.

A Lepanto- EL Indio style replacement sulphide-gold target is strongly indicated by the arsenic-antimony-gold association. Similar style high-level (epithermal) gold mineralization exists at Hushamu, and has recently been drilled by Moraga Resources. Erosion has probably removed this zone from the Island Copper deposit, locally erosion has removed some of the zone at Hushamu. At Knob Hill the area is topographically higher, and is likely to have more of the upper portion of the porphyry system intact.

SAMPLE COLLECTION, SOIL TESTING, AND ANALYSIS, PROSPECTING

Locations for all of the samples collected on the property are shown on figure 4, and rock sample descriptions are detailed in appendix 1. The rock sample (28102, or KH5) was analyzed for 30 elements by ICP and for gold and copper by acid leach/atomic absorption technique on a 10 gm sample at Acme Analytical Laboratories Ltd., Vancouver, British Columbia. The certificate of analysis are included in appendix 1. Areas of prospecting and soil testing are also shown on figure 4.

In 1990 Placer's geologists carried out soil sampling on one line on the east side of Knob Hill. Two nearby samples from this line assayed 105 and 150 ppb gold. An isolated sample pit approximately 300 m downhill to the NE showed 100 ppm arsenic when analysed. The author found the site of these samples and carried out soil depth testing to the top of the hill, downhill for over 200 metres and to the east and west for over 100 metres. In all instances the augering indicated solid bedrock within 0.5-1.2 m of surface. Soil samples were not collected because of logistics and funding. The testing verified the author's belief that soil sampling would be a very satisfactory method of identifying anomalies around Knob Hill. Soil sampling would not be particularly effective however in the flatter plateau area, where the majority of the copper (basal till) anomaly lies.

Rock samples were collected from the traverses carried out in both June and July. As there was no established grid on the property, and outcrops are widely scattered, the work was mainly in the form of prospecting. This prospecting was to determine the extent over which significant sulphide mineralization could be recognised, and to verify the nature of Chevron's geological map (revised and shown as figure 4). Various rock samples were brought back to Vancouver to be used as specimens to entice funding for the project.

The petrological report was commissioned for four of the more significantly altered rocks, and is included in appendix 2. This report details the mineralogy and alteration character as recognised in polished thin section. Two of the samples collected (KH4, 6) were selected as representative of alteration styles in intrusive and volcanics. The other two samples (KH3,5) were selected to try to determine the origin and alteration of what appeared to be parts of the volcanic sequence as found in the numerous small outcrops and frost boils on the south-east side of Knob Hill.

CONCLUSIONS AND RECOMMENDATIONS

1. The extremely high number of gold particles reported from Placer Dome's sampling indicates that a significant gold source is present locally. (A reasonable target for a Le Panto style of deposit would be 1-30 million tonnes of 1-3 gram/tonne gold).

2. A new soil sampling grid could be easily established over the majority of the area previously shown to be anomalous in copper from Cevrons work. Extensions of the grid could cover the high sulphide alteration, and silicification mapped in the Knob Hill trig area. Detailed soil sampling and multi-element analysis should be carried out to identify the extent of the gold and arsenic anomalies found by Placer.

3. The existing drill hole coverage is inadequate to evaluate the very large high sulphide alteration zone noted on the property. The existing holes only serve to show that the alteration is typical of Island Copper-Hushamu style, and that there is potential for high-level gold rich sulphide replacements.

STATEMENT OF COSTS

1.0 Personnel

P. Dasler, Geologist - 3 days @ $380/day		$ 1,140.00
D. Pawliuk, Geologist - .25 days @ $340/day		85.00
	sub total	1,225.00

2.0 Food and Accommodation

2 days @ $50	100.00

3.0 Transportation

Helicopter (1 trip only applied)	1,031.47
(4X4 truck, supplies) 3 days @ $75	225.00

4.0 Field Supplies (flagging, topo, etc.) 10.00

5.0 Office Costs (typing, copying) 50.00

6.0 Analyses

1 rock for 30-element ICP, Au by acid leach, and copper assay	32.47

TOTAL **$2,673.94**

Kamaka Resources Ltd.
6074, 45A Avenue, Delta, B.C. V4K 1M7 Phone: (604) 940-1591

CERTIFICATE OF QUALIFICATIONS

I, Peter G. Dasler, do hereby certify that:

1. I am a geologist and principal for Kamaka Resources Ltd. with offices at 6074, 45A Avenue, Delta, British Columbia.

2. I am a graduate of the University of Canterbury, Christchurch, New Zealand with a degree of M.Sc., Geology.

3. I am a Fellow of the Geological Association Of Canada, a Member, in good standing, of the Australasian Institute of Mining and Metallurgy, and a Member of the Geological Society of New Zealand and a registered Professional Geologist with the Province of British Columbia.

4. I have practised my profession continuously since 1975, and have held senior geological positions and managerial positions, including Mine Manager, with mining companies in Canada and New Zealand.

5. This report is based on my fieldwork, assisted by D. Pawliuk, on the Knob Hill Property, and from reports of Professional Engineers and others working in the area.

6. Kamaka Resources is the beneficial owner of the Knob claims. I am a principal of Kamaka Resources Ltd. This report is prepared for assessment purposes only.

Peter G. Dasler, M.Sc., FGAC P. Geo.
February, 1994

APPENDIX 1

Certificates of Analysis

Sample Descriptions

1993 ROCK DESCRIPTIONS

Sample Number

KH1	Siliceous, rusty pyrite rich volcanics. On central claim line approx 270 m south of Knob Hill trig. Sample in outcrop.
KH2	Parsons Bay Fm from creek gully on north side of block. Bleached, finegrained ash tuff with faint laminations. 1% disseminated pyrite.. Pink garnet mineralization 1%.
KH3*	Siliceous pyrite rich volcanics 500 m south knob hill trig. V. Fine ash tuff? Trace sphalerite?
KH4*	Actinolite skarn in fine grained green volcanics. Sample from 1976 drill programme unknown hole or footage. Sample for polished section work.
KH5*	Very rusty lapilli tuff. Exterior bleached to light tan. Interior grey-green with extensive pyrite dissemination. Dark clots (covellite?). Lapilli fragments to 2 cm. Rough exterior texture because of fragments.
KH6*	Dark grey-green volcanic tuff with purple discoloration from pervasive biotite alteration. Sample from 1976 drill core, unknown hole or footage.

* see petrological report appendix 2

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716

GEOCHEMICAL ANALYSIS CERTIFICATE

Kamaka Resources Ltd. File # 93-1854

6074 - 45A Ave, Delta BC V4K 1M7 Submitted by: Peter Dasler

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
K45 C 28102	1	46	<2	197	.3	16	11	1188	3.87	5	<5	<2	2	84	.3	<2	<2	75	1.25	.035	3	31	1.46	43	.14	5	3.68	.54	.05	<1

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS > 1%, AG > 30 PPM & AU > 1000 PPB
- SAMPLE TYPE: ROCK

DATE RECEIVED: AUG 6 1993 DATE REPORT MAILED: Aug 11/93 SIGNED BY ..... D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

** TOTAL PAGE.002 **

ACME ANALYTICAL LABORATORIES LTD. 852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6 PHONE(604)253-3158 FAX(604)253-1716

ASSAY CERTIFICATE

Kamaka Resources Ltd. File # 93-1854

6074 - 45A Ave. Delta BC V4K 1M7 Submitted by: Peter Daslet

SAMPLE#	Cu %	Au** oz/t
~~C 28101~~	~~20.129~~	~~.002~~
K45 C 28102		- .001

1 GM SAMPLE LEACHED IN 50 ML AQUA - REGIA, ANALYSIS BY ICP. AU** BY FIRE ASSAY FROM 1 A.T. SAMPLE.
- SAMPLE TYPE: ROCK

DATE RECEIVED: AUG 6 1993 DATE REPORT MAILED: Aug 11/93.

SIGNED BY. C. Leong .D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

APPENDIX 2

Petrological Report

PETROGRAPHIC REPORT ON FOUR POLISHED THIN SECTIONS FROM VANCOUVER ISLAND

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KH3: BRECCIATED ?INTERMEDIATE PLUTONIC ROCK, ALTERED TO CHLORITE-SERICITE-PYRITE, CUT BY THIN ANDESINE-QUARTZ VEINLETS

Dark green and white, brecciated, pyritic, possibly plutonic igneous rock cut by thin white fractures with white hard envelopes. Dark green areas are soft and fine-grained. No attraction to a magnet; no reaction to cold dilute HCl. In polished thin section, the modal mineralogy is approximately:

Plagioclase feldspar (andesine?)	60%
Chlorite (2 varieties)	25%
Sericite	5%
Pyrite	5%
Quartz (mainly secondary)	3%
Rutile, ilmenite, trace sphene	2%
Carbonate, ?zircon	tr

Plagioclase feldspar makes up the bulk of this slide, as both euhedral crystals to 2 mm long and finely comminuted, broken shards about 0.1-0.2 mm in size. In places, glomeratic aggregates up to 3.5 mm in diameter occur; these may be fragments of a ?former plutonic rock. The plagioclase is mildly sericitized in places to fine sulbhedral flakes up to 0.1 mm diameter, but twinning is still evident with extinction angles Y^010 of up to 27°, and the relief appears slightly higher than that of quartz, indicating a composition of andesine, about An_{40}. Compositional zoning is absent, suggesting the observed composition is secondary.

Chloritic patches up to 7 mm across are of subhedral to irregular outline, suggestive of replacement of former ?mafic crystals up to 6 mm long. The patches are dominated by either one of two varieties of chlorite, either length-fast, with anomalous green interference colours or length-slow, with anomalous blue interference colours. Both have very similar pale green pleochroism, indicating similar Fe:(Fe+Mg) ratios close to 0.5. The crystals are subhedral and average about 0.1 mm diameter. There are minor amounts of fine-grained TiO_2 minerals, such as rutile as cores to sphene , forming aggregates to 0.2 mm across, in the chloritic areas. In addition, in places there are traces of quartz, plagioclase, sericite and a mineral similar to sericite but forming radiating rosettes up to 0.25 mm diameter, that may be pyrophyllite (although detailed X-ray work would be needed to confirm this). Skeletal laths of rutile probably reflect relict titanomagnetite crystals up to 0.2 mm; traces of ilmenite remain.

Thin veinlets crossing the slide are of quartz, plagioclase and traces of sericite, chlorite and carbonate. Plagioclase in the veins forms small subhedral crystals up to 0.25 mm long, with extinction angle Y^010 about 20° and relief about the same as that of quartz indicating an andesine composition about An_{35}, similar to that of the plagioclase in the wall rock. Quartz in the veins (and in rare fine patches in the wall rock) forms fine sub- to anhedral crystals about 0.05 mm in diameter. Traces of limonite are found along late fractures in the centers of the veinlets.

Pyrite generally forms sub- to euhedral crystals up to 0.5 mm across, although aggregating to several mm diameter clumps. Pyrite is associated with minor secondary quartz, sericite and chlorite, and appear to be earlier than the feldspathic veinlets.

In summary, this appears to be a chloritized, brecciated, pyritic ?dioritic rock that has been cut by late andesine-quartz veins.

KH4: STRONGLY PLAGIOCLASE-CHLORITE-CALCITE SERICITE ALTERED ?PLUTONIC ROCK, VEINED BY TOURMALINE-CALCITE-QUARTZ-MAGNETITE-PYRITE

Dark and light green, brecciated-looking rock that attracts a magnet and reacts strongly to cold dilute HCl in places due to fine-grained calcite. Dark green to black areas are irregular in outline, up to 1.5 cm across, softer than steel, and contain most of the pyrite whereas pale creamy green host to these areas is harder than steel, with white borders adjacent to the dark green areas. In polished thin section, the mineralogy is approximately:

Plagioclase feldspar (relict priamry and secondary)	30%
Chlorite	30%
Tourmaline (schorlitic)	20%
Carbonate (calcite)	10%
Sericite	5%
Quartz (secondary, mainly veins)	2%
Magnetite	2%
Pyrite	1%
Rutile, sphene	<1%

The light creamy green areas of this section are similar to the main mass of KH3; although considerably more altered to fine sericite, carbonate and chlorite, they appear to have been mostly feldspar originally. Some of this feldspar forms ghosted relict crystals up to 1 mm long, but most is found as very fine-grained (25 to 50 m) subhedral crystals. Where these smaller crystals are clear and about 50 m in size, they look secondary (as in the veins of KH3). Thus there appears to be both relict primary and also abundant secondary plagioclase in this sample. The composition is not determinable due to the alteration of primary and small size of secondary crystals. At the margins of the feldspathic areas, secondary recrystallized feldspar is common, as clear but anhedral grains that cannot be distinguished from quartz; if quartz is present, it is not obvious due to the similarity of indices, suggesting a andesine plagioclase composition as in KH3. Minor TiO_2 relic crystals are of rutile/sphene.

Chloritic areas are composed of fine subhedral flakes to 25 m diameter, mainly with anomalous blue interference colours and length-slow character indicating slightly higher Fe content than in KH3. Near and in the tourmaline veins, chlorite is coarser grained, up to 0.2 mm, with bright green pleochroism confirming an Fe:(Fe+Mg) ratio around 0.5-0.6. Minor chlorite with anomalous green interference colours and less pleochroism is present, indicating lower Fe contents.

Coarse, bladed tourmaline crystals up to 1.5 mm long are found in the veins and dark green patches, intimately mixed with coarse subhedral crystals of calcite to 3.5 mm diameter. Deep sea-green pleochroism of tourmaline indicates high Fe:(Fe+Mg) ratios probably up to 0.8. There is some quartz, as subhedral crystals to 0.25 mm, present in the veins. Magnetite forms sub- to euhedral crystals to laths up to 1 mm long, concentrated in the dark green chloritic areas. Minor fine anhedral pyrite up to 0.25 mm in diameter is intimately mixed with the magnetite in places, indicating a common origin, possibly replacing former bladed Fe-silicates (such as the coarse tourmaline with which it is closely associated). Similar aggregates of magnetite and pyrite are also found along tourmaline-carbonate-chlorite veins. Pyrite is also found as scattered aggregates to 1 mm across of rounded subhedral crystals up to 0.4 mm diameter.

KH5: CHLORITE-EPIDOTE SERICITE-PYRRHOTITE-QUARTZ ALTERED FRAGMENTAL VOLCANIC OF INTERMEDIATE (ANDESINE-QUARTZ PHYRIC) COMPOSITION

Light grey-green brecciated or fragmental ?intermediate volcanic rock containing subrounded clasts to 1 cm long of grey to creamy colour in a comminuted matrix. There is only a trace of reaction to cold dilute HCl in 3-4 mm long rusty limonite patches, and the rock is only weakly magnetic in places. It is hard and siliceous. In polished thin section, the mineralogy is approximately:

Plagioclase (andesine?)	70%
Chlorite	10%
Quartz (mainly phenocryst shards; minor secondary)	5%
Epidote	5%
Sericite	5%
Pyrrhotite (trace marcasite)	3%
Rutile, sphene	2%
Chalcopyrite, sphalerite	tr

Plagioclase is found as both sub- to euhedral crystals and ?shards of crystals up to 1 mm long and as fine laths in the matrix hosting the larger crystals. In turn, fragments of this porphyritic to tuffaceous rock are found with rounded outlines, and scattered crystals or shards of quartz to 1 mm long, in a matrix of crushed similar material plus minor chlorite and TiO_2 minerals (sphene, rutile). It is difficult to judge the feldspar composition due to fine-grained sericite and epidote alteration, but poor extinction angles of about 30° and relief about the same as or higher than quartz suggest andesine to possibly labradorite composition, about An_{45-50}.

Chlorite forms patches up to about 1 mm across with highly irregular outlines; mixtures with epidote, quartz and skeletal rutile suggests these may represent former mafic crystals that have been thoroughly altered. As in KH3, both green and blue anomalous interference colours are seen, although both varieties have only weak green pleochroism and a Fe:(Fe+Mg) ratio probably around 0.5.

Epidote is found as clusters of sub- to euhedral crystals up to 0.4 mm long with anomalous interference colours and no pleochroism indicating Fe-poor composition (clinozoisite). Epidote is associated with chlorite as replacement of feldspar and ?former mafic crystals, and appears to be related to a system of late fractures along which limonite is common.

Minor secondary quartz is found as subhedral crystals to 0.25 mm size around pyrrhotite that forms sub- to euhedral crystals up to 0.5 mm diameter, or in aggregates of somewhat porous masses to 2 mm long, loosely associated with microfractures along which epidote is found and limonite has penetrated. Note that the sulphide is **pyrrhotite**, not pyrite, and it is found in the matrix of the rock; only rarely does it replace feldspar phenocrysts. Rare subhedral crystals of fine chalcopyrite to 50 m and sphalerite to 0.1 mm are found associated with the iron sulphides in some areas. In places, the pyrrhotite shows incipient oxidation to marcasite.

This appears to be an intermediate to felsic, fragmental volcanic rock composed of variably ?andesine-quartz mafic phyric clasts and broken shards in a comminuted matrix of similar material, altered to chlorite-epidote-pyrite quartz-sericite. In contrast to KH4, most feldspar appears to be primary rather than secondary.

KH6: FRAGMENTAL ?BASALTIC ANDESITE, STRONGLY ALTERED TO SECONDARY BIOTITE, TREMOLITE-ACTINOLITE, QUARTZ, PYRRHOTITE AND CALCITE

Dark green to brown, fine-grained, altered ?porphyritic volanic rock that reacts moderately to cold dilute HCl both along fractures and in disseminated crystals. Parts of the rock are strongly magnetic. A coarsely fragmental texture, with sub-rounded to sub angular clasts up to 2.5 cm diameter, is evident in the hand specimen. In polished thin section, the mineralogy is approximately:

Plagioclase (labradorite)	45%
Secondary biotite	25%
Tremolite-actinolite	15%
Secondary quartz	5%
Pyrrhotite	5%
Carbonate (calcite)	2%
Sericite	2%
Chlorite	1%
Ilmenite	<1%
Chalcopyrite, trace sphalerite	tr

This is a porphyritic volcanic rock, with fragments composed mainly of plagioclase and lesser mafic relict amphibole crystals, in a finer-grained groundmass of secondary biotite and in some cases pyrrhotite. The matrix consists mainly feldspar shards and secondary biotite. There are also clasts formed almost entirely of tremolite-actinolite, with minor pyrrhotite.

Plagioclase forms euhedral crystals up to 2 mm long with extinction angle Y^010 up to 31° indicating a calcic composition somewhere around labradorite, An_{55}. Most crystals show minor alteration along fractures and cleavages to fine secondary biotite and minor sericite. Relict euhedral crystals of ?pyroxene up to 1 mm long are replaced by a pale green secondary amphibole, probably of actinolitic composition. Rare patches of chlorite with weak anomalous green interference colours and length-fast character, indicating a more magnesian type with Fe:(Fe+Mg) about 0.4, occur. The matrix consists of fine brown secondary biotite as subhedral crystals to about 50 m diameter, mixed with fine pale green actinolitic amphibole to 100 m long. Some clasts are very fine-grained and consist mainly of plagioclase microlites and mafic crystals replaced by secondary biotite in a groundmass of secondary biotite.

Pyrrhotite is the principal sulphide present, forming fine subhedral disseminated crystals to about 0.5 mm diameter as well as large masses up to 1 cm across. Traces of chalcopyrite, as anhedral crystals to 0.1 mm diameter, and ?sphalerite as subhedral crystals to 20 m, are found included in the pyrrhotite. Ilmenite forms ragged to skeletal crystals up to 0.5 mm diameter, in places associated with sulphides. Rutile is rarely present, away from the sulphides, as fine wispy aggregates of crystals to 30 m long.

Veinlets of tremoltie-actinolite, in places with secondary bioitte, and rare calcite, traverse the slide; the calcite set may be the later, and contain a little quartz in places. This is a fairly mafic volcanic rock, probably of typical Bonanza basaltic andesite composition as indicated by the labradorite, pyroxene and ilmenite; alteration is to a mafic potassic assemblage of secondary biotite and amphibole, again characteristic of the Bonanza e.g. at Island Copper.

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