NORTH PACIFIC MINES LTD. N.P.L.
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VANCOUVER, BRITISH COLUMBIA

REPORT ON HOLDINGS IN BRITISH COLUMBIA AND NOVA SCOTIA

ALLEN GEOLOGICAL ENGINEERING LTD.
UNITED KINGDOM BUILDING
VANCOUVER B.C.
MARCH 1967

REPORT

ON

THE HOLDINGS

OF

NORTH PACIFIC MINES LTD. N.P.L.

IN

BRITISH COLUMBIA

AND

NOVA SCOTIA

ALLEN GEOLOGICAL ENGINEERING LTD.
UNITED KINGDOM BUILDING
VANCOUVER B. C.

MARCH 21, 1967

ABSTRACT

The holdings of North Pacific Mines are chiefly in the Highland Valley of British Columbia near a 10,000 ton-per-day porphyry copper open pit operation; and in the Cheticamp area of Nova Scotia where silver-lead-zinc-copper deposits are being investigated.

The Krain property has reached the development stage and more than half of this report is devoted to it, including tonnage and grade estimates, as follows: -

Drill Proven,	20,023,574 ton grading 0.4514 % copper
Probable,	60,550,000 ton grade not estimated
Possible,	not estimated

Silver and molybdenum occur with the copper but average grades have not yet been estimated.

In order to add to the presently estimated reserves, and supply necessary information for a feasibility study a $500,000.00 development programme is recommended. This includes additional diamond drilling, driving a tunnel the length and breadth of the mineralized zone, a pilot plant for mill-tests and heap leaching tests on the oxidized material.

Preliminary calculations, using present cost figures and metal prices, point to a possible operating profit of $1.30 per ton milled.

Exploration programmes are also recommended on the Dansey and Cheticamp properties amounting to $50,000.00 and $31,000.00 respectively.

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THE HOLDINGS OF NORTH PACIFIC MINES

BRITISH COLUMBIA

AND

NOVA SCOTIA

I. INTRODUCTION

The object of this report is to compile all available data regarding the holdings of North Pacific Mines in British Columbia and Nova Scotia under one cover.

The bulk of the report comprises data pertaining to the Krain property in the Highland Valley area of British Columbia with lesser coverage to the nearby Dansey property. The writer has for the past thirty years been engaged in geological and mining work in the Highland Valley area, and since 1964 has acted as consultant for North Pacific Mines and directed most of the work on the subject properties. The Krain property is in the development stage and the works programmes herein recommended should supply the necessary data for pit design and a feasibility study. The Dansey property is in the stage of a prospect upon which much of the necessary basic work has been completed. The Nova Scotia property is in the prospect stage, the writer has not examined it, and the data herein has been acquired from sources listed under references.

Some of the subjects are covered by resumes only since complete description would add considerable bulk to the report and

the data is readily available. Most aspects pertaining to the Krain are detailed, however, particularly the aspects of present reserves and the potential of the property.

Maps are included, mostly under separate cover but some are bound with the report.

II. THE BRITISH COLUMBIA PROPERTIES

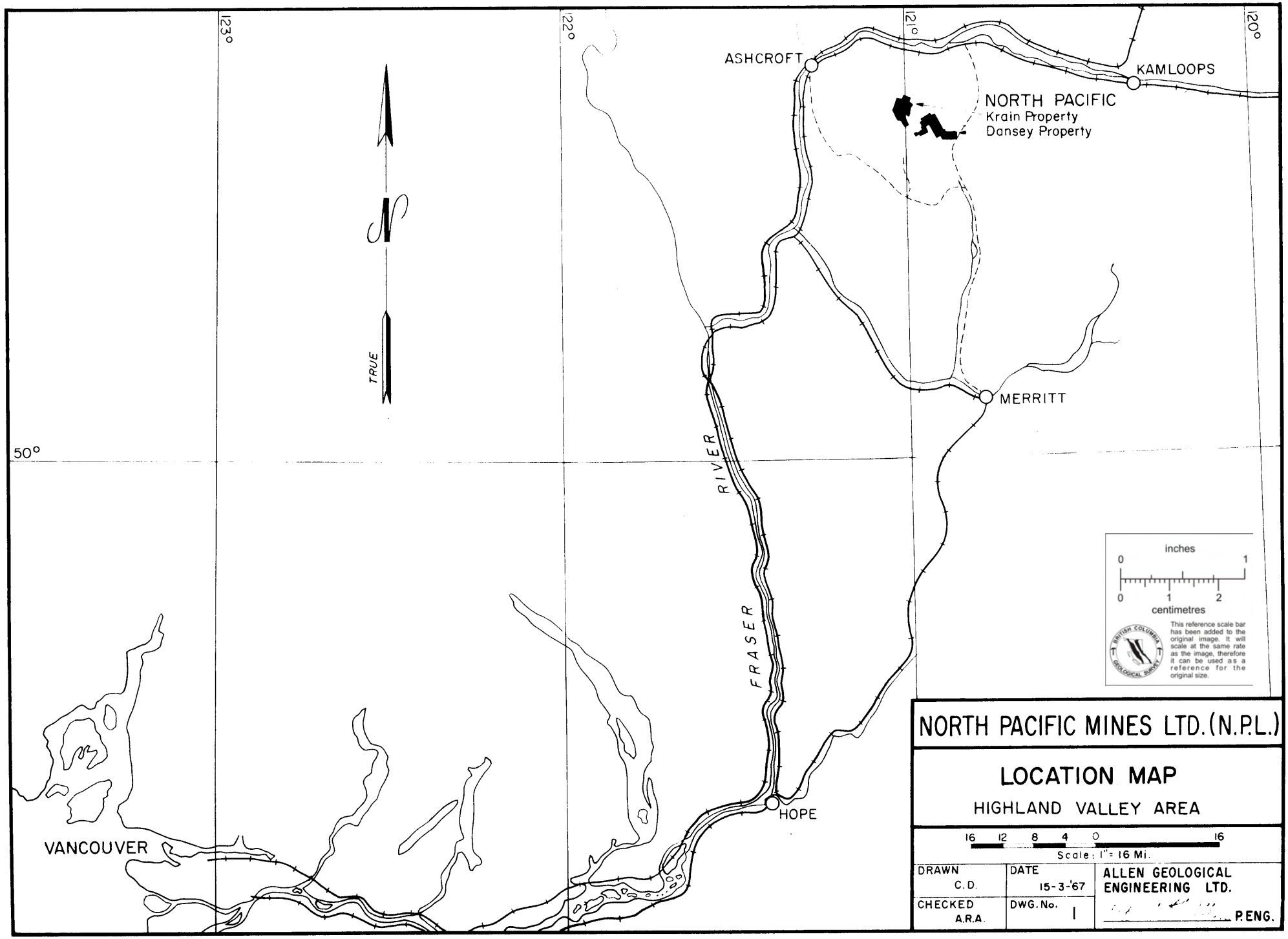
A. INTRODUCTION

The Krain and Dansey properties, located near the Bethlehem mine, are readily accessible and close to all services and supplies.

The coverage herein given to the Krain property is largely as a result of the well documented data available from the files of organizations that have carried on exploration programmes since 1956; such as Beaverlodge Uranium Mines, Farwest Tungsten Copper Mines, Northwestern Explorations (a Kennecot subsidiary) and the British Columbia Department of Mines.

B. LOCATION AND ACCESSIBILITY

The properties of North Pacific Mines are located north and northeast of the Bethlehem Mine in the Highland Valley area of British Columbia. This is in south central British Columbia known as the "dry belt". The claims lie between west



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LOCATION MAP

HIGHLAND VALLEY AREA

16 12 8 4 0 16

Scale: 1" = 16 Mi.

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longitudes 120°-50' and 120°-53' and north latitudes 50°-32'00' and 50°-33'-30". There are good secondary roads connecting with main highways passing through Ashcroft, Kamloops and Merritt. The main lines of the CPR and CNR pass through Ashcroft.

Access from Ashcroft to the Krain property is via paved highway to the Bethlehem Mine, a distance of thirty miles. One mile before reaching the Bethlehem there is a turn-off, and from there by secondary road it is seven miles to the Krain. From the Bethlehem turn-off the main Highland Valley road extends to Guichon Creek where it joins the roads leading southeast to Merritt, northeast to Kamloops and northwest to Savanah. From this junction, three miles towards Savanah, there is a secondary road which crosses Guichon Creek and extends a mile and one half to the main trenched zone on the Dansey property. An alternate route is via the B.X. Mines road which extends westerly from the Highland Valley road, a mile north of the airport, seven miles to the Dansey camp. A third route is via a secondary road east from near the Trojan camp to the Dansey showings. All-year access is maintained where required over all the aforementioned secondary roads. There are no excessively steep grades. It is 225 miles from Ashcroft to Vancouver.

C. TOPOGRAPHY

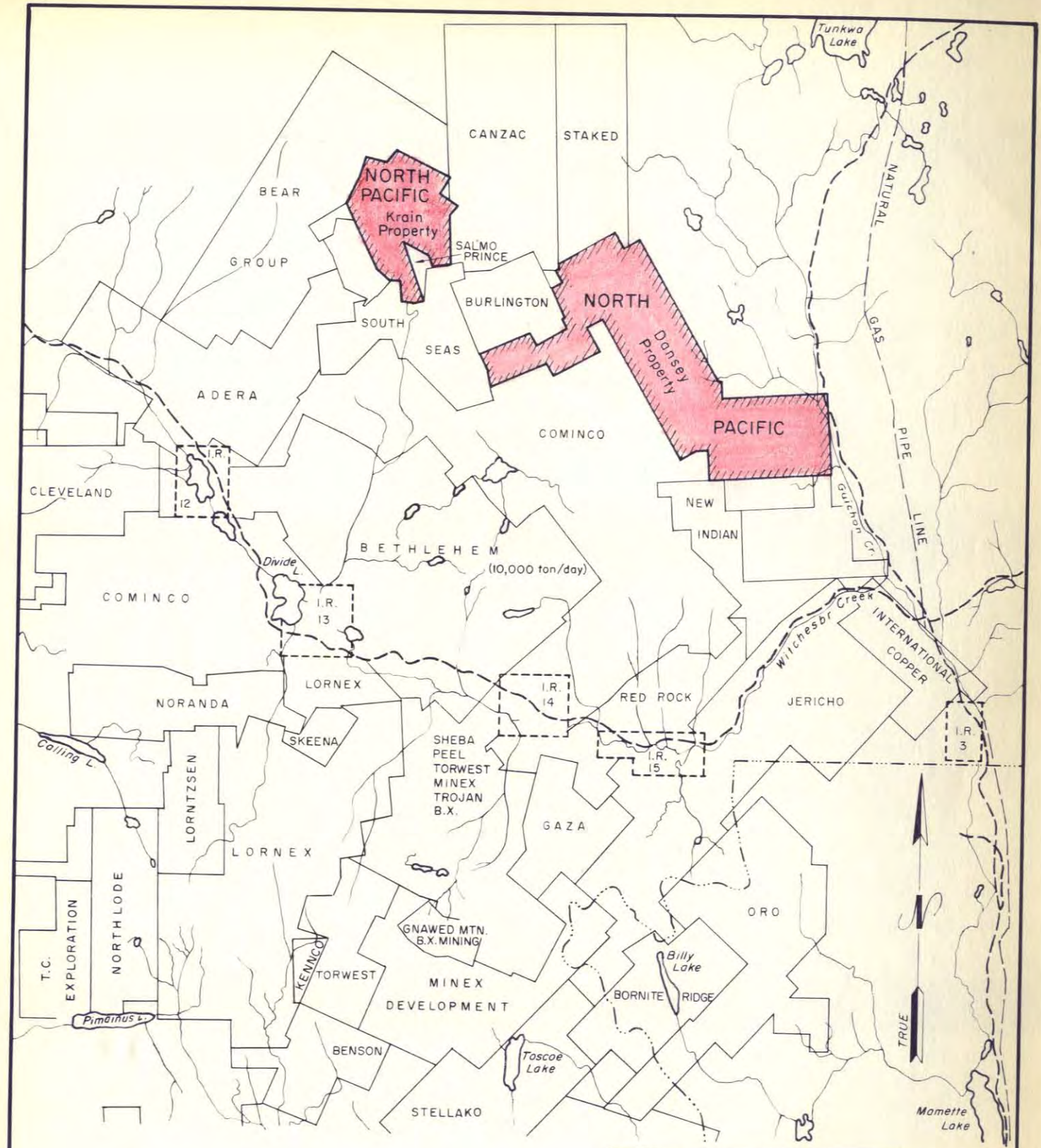
The Highland Valley is located in the region of southwestern British Columbia known as the Interior Plateau. From Divide Lake, about seven miles south of the Krain property, the

valley is drained by Pukaist Creek flowing west to the Thompson River, and Witches Brook which flows east into Guichon Creek. Valley elevations are 3,500 to 4,000 feet above sea level. The surrounding hills are rounded and up to 6,400 feet above sea level. The slopes are gentle. The valley is wide and open. Drainage from the many feeder creeks and the main streams is light. The creeks are small, some intermittent, and the lakes and sloughs generally brackish, with the water colored brown many months of the year.

The claims comprising the North Pacific Mines properties extend from near the top of Forge Mountain (6,400 feet elevation), down the southeast side and southeasterly to Guichon Creek, at an elevation of 3,500 feet above sea level. On the Dansey property many narrow fairly deep canyon-like excavations in the granitic bedrock are believed to be meltwater channels. Small shallow lakes and sloughs are scattered sparingly over the properties.

D. CLIMATE

Typical of the "Dry Belt" of the British Columbia Interior Plateau, the precipitation seldom exceeds twelve inches per year. On the lower levels it is hot during the summer but on the Krain and Dansey properties it is warm to cool during most of the summer. Winter weather may be severe for short periods during December to February. Snowfall is moderate and there is seldom an accumulation of more than three or four feet. Mining operations are conducted throughout the full year without undue weather difficulties.



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BRITISH COLUMBIA GEOLOGICAL SURVEY

NORTH PACIFIC MINES LTD. (N.P.L.)

PROPERTY MAP

HIGHLAND VALLEY AREA

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Scale: 1" = 4 Mi

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E. TIMBER

Light stands of small timber cover the hills of the area. The predominant evergreen is jack-pine but there are, here and there, small stands of fir. Much of the area, has, during the past few years, been logged off. Willow, birch, aspen and vine maple and alder flourish. Mine timber may be acquired from the sawmills at Merritt. Good fir, cut and partially shaped, costs about $100.00 per M delivered to the property.

F. WATER

In general throughout much of the Highland Valley area the water supply is limited. Both on the Krain and the Dansey there are small shallow sloughs and lakes connected by small sluggish streams, many of which dry up in a very dry season. There are sub-surface basins, however, which may be tapped, such as Witches Brook where a supply is acquired for the Bethlehem operation.

G. POWER

The British Columbia Hydro supply the Bethlehem mine. Diesel generators are used for power on the properties in the Highland Valley undergoing exploration and development. New mining operations will be able to acquire power from the British Columbia Hydro.

H. FACILITIES

There are camp buildings on the Krain to accommodate about 30 men. Diamond drilling, through the winters of 1964 and 1965, was carried on without undue time losses or difficulties because of weather conditions.

There is one small frame building on the Dansey property suitable for a field office with sleeping accommodation for one man.

By arrangement with the B.C. Telephone Company, radios were used from both camps during 1964-66, for communication purposes.

I. GEOLOGY

The dominant feature of the area is the Guichon Creek batholith, an igneous complex which outcrops over a length of 40 miles in a northsouth direction and a width of 16 miles. Much of the northeasterly portion is covered with Tertiary volcanic rocks. The batholith intruded sedimentary rocks of the Permian Cache Creek Group and andesite and greenstone of the Upper Triassic Nicola Group. The Highland Valley traverses the central section of the batholith in a northwest-southeast direction. The bulk of the batholith is composed of grey, medium-grained quartz diorite designated as the "older quartz diorite", or "Guichon quartz diorite". It is composed of unformly distributed

feldspars (about 70 %), hornblende and biotite (about 18 %) and quartz (10 %), with hematite, magnetite and sphene the common auxiliary minerals.

Large igneous masses have intruded the older quartz diorite and these are porphyritic at and near their boundaries. Some range from quartz diorite, granodiorite, quartz monzonite and granite in composition.

Southwest of the Highland Valley there is a large body of granodiorite porphyry about six miles long and four miles wide. Emanating from this are younger porphyry dykes which are numerous over an area ten miles long by three to five miles wide. The dykes are mostly dacite porphyry, quartz porphyry, feldspar porphyry and andesite porphyry.

Associated with the porphyry dykes are zones of brecciation. The largest, termed "explosive breccia" is believed to have been formed by an increase in vapour pressure when the intruding material encountered cooler near-surface conditions and crystallized. There are smaller breccia zones along the walls of some of the dykes. Large and small breccia zones acted in many locations as host for copper-gold-silver-iron-molybdenum mineralization. Faulting and fracturing is usually strongly evident at and near the breccia zones.

Rock alteration is evident in the mineralized zones. Strong argillic alteration is usually prevalent. Feldspathization, sericitization chloritization and kaolinization of the host rocks

appears strongest where sulphide mineralization is heaviest.

Sulphide mineralization occurs throughout some of the brecciated and fractured zones and near and within porphyry dykes.

Chalcopyrite and pyrite are the most common sulphide minerals. Bornite is associated with chalcopyrite on some properties. On the Bethlehem it accounts for half the copper in some sections of the East Jersey Zone, and whereas it is rarely encountered on the Trojan, it is common on the Krain. Molybdenite occurs in most of the mineralized zones, usually as very fine diseminated flakes or as coatings on joint planes. Hematite occurs in most deposits, being most strongly developed on the Trojan. Surface outcroppings on some of the deposits, particularly the Krain, are heavily oxidized and the most common minerals in these chrysocolla, malachite, azurite, limonite, chalcocite, cuprite and native copper.

Much of the northeastern part of the area is blanketed with Tertiary volcanic rocks, chiefly basalt with lesser andesite, rhyolite and tuff. Irregular errosional contacts occur between the volcanics and underlying igneous rocks and small isolated patches of volcanics are common.

The structural pattern within the batholith is complex and often difficult to detail. It may, however, be the control for the localization of most of the mineralized zones. The younger instrusives were apparently localized by pre-intrusive faulting, which in general has a northerly trend. Subsequent and

contemporaneous shearing fracturing and brecciation also influenced the deposition of metallic and associated minerals.

J. THE KRAIN PROPERTY

1. INTRODUCTION

The principal holdings of North Pacific Mines in the Highland Valley is the Krain property. Limited stripping and trenching but considerable drilling has partially outlined a large mineral deposit containing copper along with accessary molybdenum, silver and gold.

2. LOCATION AND ACCESSIBILITY

The Krain property is located in the Highland Valley Area of south central British Columbia. This is at longitude 120°-53' west and latitude 50°-33' north. It lies within the central part of the rectangle formed by the towns of Ashcroft, Kamloops, Merritt and Spences Bridge. It is seven miles by road north of the Bethlehem mine. Access from Vancouver is by the Fraser Canyon highway to Ashcroft, a distance of 225 miles. From Ashcroft via black top highway it is 30 miles to the secondary road which leads north seven miles to the Krain camp. The climb from Ashcroft is 5,000 feet.

There is a landing field for light planes near the Bethlehem mine.

3. HISTORY

Gold was discovered in the Thompson River gravels in 1857. The subsequent influx of miners and prospectors resulted gradually in a switchover from placer to hardrock interest. Hence the area was prospected, and by the 1880's claims were being staked and worked. High grade deposits were investigated and during the first world war the O.K. mine was placed into production and 10,000 tons of 3.6% copper ore was shipped. Over the years many properties were investigated by major companies but the grade of the deposits was below the requirements of the day.

In 1955, spurred by the growing demand for copper, the Highland Valley was the scene of exploration programmes on many properties, and by 1958 sizeable deposits of low grade porphyry copper were under development. The Bethlehem property was brought into production, November 1962. The spectacular success of this operation resulted in renewed activity, and serious exploratory work was started on such properties as the Trojan, Krain, Jericho and Lornex.

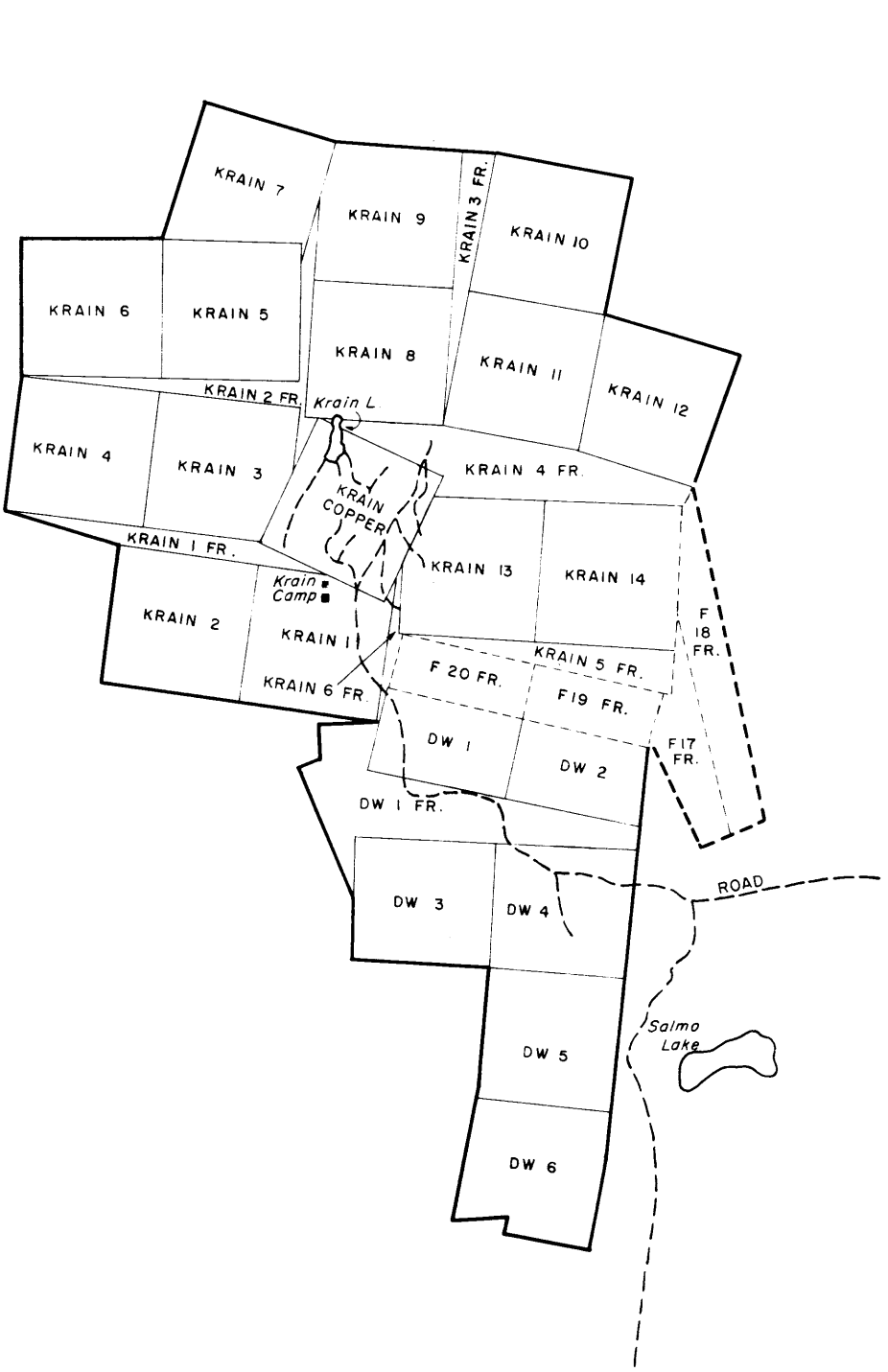
The Krain property was acquired from the Krain Copper-Beaverlodge Uranium-Farwest Tungsten group in 1964. The above named group has expended about $200,000.00 on exploratory work between 1955 and 1957. From 1957 until 1959 it was held under option by Northwestern Explorations Ltd., a subsidiary of Kennecot Copper, and an additional $100,000.00 was expended. North Pacific

Mines acquired it in 1964 and instigated an aggressive diamond drilling programme using newly developed equipment which gave excellent core recovery. It was subsequently optioned to Canex Aerial Exploration Co. and through 1965 and into 1966 they continued diamond drilling. Throughout the past ten years, therefore, in excess of $500,000.00 has been expended on this large porphyry-type deposit containing copper with auxiliary molybdenum, silver and gold.

4. PROPERTY

The following claims constitute the Krain Group held by North Pacific Mines Ltd. N.P.L.

Claim	Record Number	In Good Standing Until
Krain Copper	5298	13 July 1981
Krain Nos. 1,2,3,14	14939,40,41,52	13 June 1971
Krain No. 5	14943	13 June 1978
Krain Nos. 4,6,7,9,10	14942,4,5,7,8	13 June 1969
Krain Nos. 8, 11	14946,9	13 June 1970
Krain No. 12	14950	13 June 1973
Krain No. 13	14951	13 June 1980
D.W. Nos. 1,2,4,5	23810,11,13,14	11 June 1967
D.W. No. 3	23812	11 June 1968
D.W. No. 6	26318	11 June 1966
D.W. No. 1 Fr.	23840	8 June 1967
Krain Nos. 1,3,6, Fr.'s	20504,6,9	20 Feb. 1970
Krain Nos. 2 & 5 Fr.'s	20505,8	20 Feb. 1971
Krain No. 4 Fr.	20507	20 Feb. 1980
F. 17 to 20 Fr.'s Inc.	43728/31	26 June 1967



NOTE :

LOCATIONS OF CLAIMS ACQUIRED FROM RELIABLE SOURCES, BUT SOME BOUNDARIES MAY BE APPROXIMATE

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CLAIMS MAP

KRAIN PROPERTY

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Scale : 1" = 2000 Ft.

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5. GEOLOGY

a. Introduction

The Krain copper-molybdenum-silver-gold deposit occurs associated with shearing and porphyritic intrusives in an igneous complex known as the Guichon Creek batholith. Partly covering the deposit is a layer of unmineralized volcanic rocks. Part of the deposit is oxidized and contains mostly secondary minerals. Deep diamond drilling has shown that the deposit extends to considerable depth, and there are indications that it is more extensive below the 400-foot level. Structural details are lacking, but the controlling fracture pattern may be dominated by breaks striking north 40 degrees west and dipping 30 to 50 degrees southwest and north 20 to 30 degrees east and dipping 65 to 80 degrees northwest.

b. Igneous Rocks

Light grey to reddish grey medium-grained quartz diorite makes up the mass of the Guichon Creek batholith. Large bodies of younger quartz diorite have intruded this, and dyke swarms of quartz and feldspar porphyries emanate therefrom. Sulphide mineralization is associated with these igneous rocks and with shear and breccia zones cutting them.

i) Guichon Quartz Diorite (Older Quartz Diorite)

The batholith intruded Cache Creek and Nicola sedimentary and volcanic rocks in early Jurassic time. The bulk of the batholith is made up of light grey medium-grained quartz diorite

termed the Guichon or Older Quartz Diorite. The zones of contact with the older rocks are dioritic to gabroic.

A typical specimen of older quartz diorite from the Krain property is composed of 60% plagioclase feldspar, 10% orthoclase feldspar, 15% quartz, 7% biotite, 7% hornblende and 1% apatite, sphene, magnetite and zircon.

Near the copper-bearing zones of the Krain and other properties the quartz diorite attained a pinkish hue due to alteration of the plagioclase feldspar.

ii) Bethlehem Quartz Diorite (Younger Quartz Diorite)

A second generation of intrusive activity resulted in the emplacement of a younger quartz diorite into the Guichon Creek batholith. Large bodies of this rock occur on the Bethlehem, Trojan, Lornex, Transvaal and Krain properties. On the Krain the largest body of this rock outcrops to the south of and lower in elevation than the showings. Deep drilling indicates that it may extend northerly and beneath the entire deposit.

The rock is lighter in color than the older quartz diorite. The quartz and feldspar grains are less angular, and the mafic minerals less prominent. Some phases of it are characterized by closely spaced light colored feldspar crystals, almost touching, in a groundmass of very fine grained light grey quartz, feldspar and biotite.

Disseminated chalcopyrite, pyrite and in places bornite

occur within the rock usually associated with shearing.

At and near the peripheries of bodies of the rock it is more porphyritic. Some phases are pink or brown colored.

iii) Quartz Diorite Porphyry

Cutting the Guichon and Bethlehem quartz diorites are dykes of quartz diorite porphyry. These are similar in composition to the younger quartz diorite, but usually pink and brown in color and exhibiting larger crystals of quartz and feldspar.

Along the shattered contacts of some of the quartz diorite porphyry dykes on the Krain property there are sizable chalcopyrite-pyrite-molybdenite zones.

The porphyry grades into younger quartz diorite.

iv) Feldspar Porphyry

Similar in most respects to the quartz diorite porphyry, the feldspar porphyry is in the form of dykes at and near the former. The feldspar phenocrysts are prominently displayed and light grey to white in a groundmass of fine crystalline feldspars, quartz, and lesser mafics.

Commonly in this porphyry epidote occurs in crystal aggregates.

The hornblende is usually partially or wholly altered to chlorite. The feldspars are usually partially sericitized

and kaolinized. Pyrite is commonly included in fine disseminations.

Thin section study indicates a composition of 65 % plagioclase, 2 % quartz, 5 % hornblende, 10 % epidote and the remainder unidentifiable.

v) Andesite Porphyry

On the Krain there are dykes of fine-grained dark green andesite porphyry. Lathe-shaped feldspar phenocrysts are well developed. The rock is darker, softer and more compact than the quartz-feldspar-diorite porphyries. The plagioclase is euhedral and zoned. The hornblende is coarsely crystalline. The groundmass is brown and fine grained.

c. Volcanic Rocks

The Miocene Kamloops formation overlies the igneous complex.

On the Krain, the main mineralized zone extends beneath the volcanic cover.

The volcanic rocks lie on an irregular surface, in places covered with overburden.

Most of the volcanic rocks are basalt. It is vissicular and amygdaloidal and in places porphyritic. It is interlayered with coarse-grained tuff. Rhyolite and andesite are present but to a lesser degree.

d. Structure

The dominant fault trends in the Krain follow two directions, namely north 20 degrees west with dips of 30 to 50 degrees southwest and north 20 to 30 degrees east with dips of 65 to 80 degrees northwest. Although the faults are pre-mineral and apparently influenced mineral deposition, extensive post mineral activity is indicated.

Within the mineralized zones strong fracturing and some brecciation is evident, particularly along and close to the porphyry dyke walls.

Because of the limited amount of surface work, particularly in the zone of unoxidized mineralization, structural details are lacking but much information will be acquired by underground tunneling.

e. Mineralogy

i) General

The igneous rocks on the Krain property contain a large zone of sulphide mineralization which is capped in part by a younger volcanic layer of irregular thickness.

Strong faulting along with associated brecciation, shearing and fracturing appears to be the major structural control. Dykes, particularly where there are shattered zones along the walls also effectively located some mineralization.

Primary sulphides are chiefly chalcopyrite and pyrite in disseminations and coating fractures within the igneous rocks, and less but important bornite and molybdenite zones usually very fine grained. Hematite and magnetite are minor constituents of the mineralized zones.

Secondary minerals occur chiefly within an oxidized zone making up the northwest half of the surface section of the mineralized zone. This extends to 350 feet underground but angles steeply to the surface in all directions. The minerals are chiefly chrysocolla with minor malachite, azurite, altered pyrite, altered chalcopyrite, chalcocite, limonite, cuprite, hematite, manetite and native copper. The gangue is made up of quartz, sericite, clay minerals, kaolinite, chlorite and altered feldspars.

The southeastern part of the partially exposed mineralized zone has a pyritized and silicified capping. Finely disseminated pyrite constitutes up to an estimated 10% of the rock by weight. Beneath this capping there is normal mineralization. Oxidation is negligible. This capping is from 100 to 250 feet thick.

ii) Chalcopyrite

The chalcopyrite ranges from fine disseminations requiring a 20-power hand lense to observe, to blebs one half inch across. It is also commonly in fractures and small vuggy openings. It may be intergrown with biotite and chlorite. Within the oxidized portion of the mineralized zone, chalcopyrite occurs with the oxides, carbonotes and silicates, often in a crumbly form with a coating of what appears to be sooty chalcocite.

iii) Pyrite

Finely disseminated pyrite is common throughout the mineralized zones, usually closely associated with the chalcopyrite. On the southeast portion of the exposed main zone there is irregular silicified "capping" carrying higher than normal pyrite and little chalcopyrite or other minerals. It contains, in places, more than 10 % pyrite by weight. This is considered a valuable asset, since it can be used in the leaching process which may be employed in the treatment of the oxidized portion of the deposit. As an acid generating ingredient it will be valuable, and the low grade copper associated with it will be partially recovered in the leaching process.

iv) Bornite

Bornite exhibits an irregular occurrence throughout the mineralized zone so far developed. It is finely disseminated and closely associated with chalcopyrite. To observe the particles a 20-power hand lense is required. It is also in fine fracture fillings and fairly commonly associated with molybdenite.

v) Oxidized Zone

Extending on the surface from the deep gully which trends northeasterly across the zone 150 feet northeast of number one adit tunnel portal, northwesterly up the hill to the lake, the zone is oxidized and highly fractured. The oxidized material appears to have a maximum depth of 350 feet at the location of diamond drill hole 3, about 300 feet northwest of the contact.

The surface outcropping is about 700 feet long and 500 feet wide.

It is believed to extend northerly under the volcanic cover. The oxidation is believed to be pre-Miocene and to have been protected from glacial and other erosional agencies by the volcanic cover.

In veinlets and fracture coatings, chrysocolla is the most common copper mineral within the oxidized zone. Azurite and malachite are accessory minerals. Cuprite is present in small quantities. Native copper is a minor constituent. Pyrite, chalcopyrite, chalcocite and limonite also occur as accessory minerals. In a representative sample submitted for metallurgical testing the head assay was 0.5 % copper and the copper oxide was 0.26 % or 52 % of the total.

vi) Magnetite

Magnetite, in very small specks, commonly occurs within the Guichon Quartz Diorite and also in the younger intrusive rocks.

In the areas of mineral deposits where alteration has been pronounced there is a general reduction in magnetite content. The younger quartz diorite is deficient in magnetite.

Hole 5, intersected a magnetite-rich zone near the east boundary of the Krain deposit. This is believed a local effect and not common elsewhere in the Krain, Trojan or Bethlehem deposits.

Because of the reduction in magnetite content in highly altered and mineralized zones, it has been found practical to detect same with the magnetometer, and such areas of low intensity are considered favorable exploration targets in the area.

f. Alteration

Argillic alteration is strongest and propylitization well developed. The host rocks of the mineralized zones and adjoining areas are commonly altered to a considerable degree. The plagioclase feldspars are strongly sericitized and kaolinized. Quite often a flesh to reddish colored plagioclase feldspar is prominently developed. The hornblende is chloritized and epidotized. Silicification is developed in sizeable zones which appear to be tabular. Pyritization accompanies the silicification. The biotite is converted to secondary mica and chlorite. Tourmaline is developed in small local zones. Zeolites are common in the mineralized sections of the deposit, chiefly heulandite and stilbite which are easily identifiable by their orange to red color.

6. PROSPECTING

The property and surrounding area has been prospected many times since the early 1900's. It is believed that all outcroppings have been observed and most of them mapped. Many have had a limited amount of work done on and around them where the mineralization warranted same. This work for the most part has been very superficial and limited to shallow trenching.

Prospecting in the future, therefore, will entail geophysical methods, rock trenching and drilling to test the mineralized zones to depth. A surface examination of the Krain demonstrates how large deposits may not be evident on the surface. If the volcanic cover had not been erroded from the oxidized portion of the deposit, and only the adjoining silicified and pyritized capping exposed, it would almost certainly have been passed by for many years and not developed until outlined by geophysical means.

7. UNDERGROUND WORKINGS

Two prospect tunnels were hand-mined into the oxidized portion of the Krain deposit in the early days.

The number one adit is driven northwesterly for 63 feet through strongly fractured and altered rock containing chrysocolla, malachite, azurite, chalcocite and pyrite.

Samples at 10-foot intervals from the face to the portal assayed as follows:

	Gold	Silver	Copper
	Oz/T	Oz/T	%
	Tr	0.30	1.1
	Tr	Tr	1.4
	Tr	0.20	0.9
	Tr	0.40	0.4
	Tr	0.20	0.9
	Tr	0.20	1.1
Average	Tr	0.20	0.97

The number two adit, which is 140 feet southwest from number one, is directed northwesterly for 38 feet through similar oxidized material.

Samples at 10-foot intervals from the face to the portal, assayed as follows:

	Gold	Silver	Copper
	Oz/T	Oz/T	%
	Tr	Tr	1.30
	Tr	0.20	0.60
	Tr	0.10	0.80
	Tr	0.20	1.00
Average	Tr	0.12	0.92

8 TRENCHING

In the original outcrop area, where the adit tunnels were driven, a series of small trenches exposed bedrock along a length of 250 feet. The trenches were excavated a few feet into bedrock which is oxidized and stained green and blue with secondary copper minerals. Samples assayed about the same as those from the tunnels.

Since 1956 long trenches have been bulldozed across the oxidized zone near the tunnels and at three locations down the hill a few hundred feet in attempts to expose the deposit. Because of the topography, and the oxidized, silicified and pyritized character of the deposit at this location, only limited information has been acquired, and it has been necessary to drill the deposit. Also, at numerous locations elsewhere on the property, trenching has been found to be of only limited value and,

where copper mineralization is indicated, the zones will have to be tested by drilling.

9. DIAMOND DRILLING

Fifty-three holes have been diamond drilled on the Krain property, 52 of them on the main showings and one on a strong zone of mineralization on the DW 4 claim, 4,200 feet to the south.

The work has been done in four stages. First the Beaverlodge Uranium-Farwest Tungsten Group drilled 27 holes in 1956-57. Second in 1958 Northwestern Exploration, a Kennecot Copper subsidiary, drilled two holes. Third in 1965 North Pacific Mines drilled 8 holes, and fourth in 1965-66 Canex Aerial Exploration Company drilled sixteen holes. A resumé is included on the following page.

Year	Company	Equipment	Number of Holes	Total Footage
1956-57	Beaverlodge Uranium & Farwest Tungsten	Standard AX and BX	27	9,694.5
1958	Northwestern Exploration Co. (Kennecot)	NX and BX Mud and Swivel Core Barrel	2	1,133.0
1965	North Pacific Mines Ltd. N.P.L.	BQ Wireline Mud and Swivel Core Barrel Stepped Bits	8	7,707.0
1965-66	Canex Aerial Exploration Ltd.	BQ Wireline Mud and Swivel Core Barrel Stepped Bits	16	6,612.0
Total			53	25,146.5

Details of the diamond drilling to date are as follows:

DDH Number	BEARING Degrees	DIP Degrees	LATITUDE North	DEPARTURE East	COLLAR Elevation	LENGTH Feet
1		-90	130,234	118,815	5631	213
2		-90	130,100	118,740	5611	300
3		-90	130,185	118,502	5729.5	529
4		-90	130,590	118,810	? 5250	556
5		-90	130,165	119,232	5516	470
6		-90	130,575	119,220	5587.5	497
7		-90	130,675	118,218	5743	380
8		-90	130,178	118,235	5714	346
9		-90	129,025	118,060	5687	188
10		-90	129,990	118,330	5747	250
11	270	-30	128,990	118,125	5687	347
12		-90	130,390	118,530	5740	349
13		-90	130,378	118,265	5727	367
14		-90	130,002	118,908	5586	348
15	?	-45	130,252	118,900	5607.6	347
16	315	-30	130,198	119,156	5526	259.5
17	315	-35	129,858	119,052	5590	278
18	136	-50	130,145	119,205	5601	269
19	135	-50	130,000	118,675	5612	500
20	110	-45	129,714	118,450	5700	221
21	110	-45	129,645	118,615	5585	350
22	130	-50	129,772	118,820	5643	155
23	315	-45	129,728	118,938 (approx.)	5622	498
24	90	-45	128,928	118,465	5564	460
25	335	-35	130,208	119,075	5570	400
26	270	-45	129,715	119,245	5500	431
27	270	-50	129,730	119,377	5504	386
(G.D.W. group D-1	70	-45				500)
Total						10,194.5
28	45	-45	129,469	118,850	5612	633
Total footage drilled to end of 1959						10,827.5

10,327

DDH Number	BEARING Degrees	DIP Degrees	LATITUDE North	DEPARTURE East	COLLAR Elevation	LENGTH Feet
1-65	225	-60	130,224.92	118,857.77	5,555.66	585
2-65		-90	130,006.78	118,671.94	5,569.87	1,516
3-65		-90	129,841.93	118,837.39	5,593.97	1,113
4-65		-90	130,116.10	118,738.33	5,560.20	605
5-65		-90	129,925.65	118,950.32	5,577.53	997
6-65		-90	130,210.48	118,823.96	5,564.33	930
7-65		-90	130,020.38	119,040.88	5,568.58	750
8-65		-90	129,888.25	118,626.97	5,573.35	1,211
North Pacific Total						7,707
9-65		-90	129,787.16	118,476.22	5,651.70	500
10-65		-90	129,771.40	119,084.09	5,537.77	502
11-65		-90	130,057.58	118,470.38	5,682.35	511
12-65		-90	129,952.21	119,284.70	5,474.85	342
13-65		-90	130,191.04	118,615.58	5,664.03	500
14-65		-90	130,220.08	119,508.32	5,456.40	324
15-65		-90	130,193.80	118,344.77	5,723.03	494
16-65		-90	129,489.07	119,134.96	5,510.69	320
17-65		-90	130,071.97	118,190.97	5,674.22	755
18-65		-90	130.700.58	118,249.51	5,705.85	152
19-65		-90	130,378.85	117,980.04	5,773.58	290
20-65		-90	129,922.48	118,325,39	5,698.71	519
21-65		-90	130,467.30	118,560.72	5,697.08	500
22-65		-90	129,739.99	118,214.98	5,701.54	163
Total						5,872
1-66 (not shown on Canex plan)		-90	129,531	118,880	5,562	500
2-66 (shown in different location!)		-90	130,556	118,704	5,728	240
Total						740
Total footage drilled to end of 1966						25,146.5

24,646 on Krain
+ 2,739 (1967)
27,385

Core recovery was poor for the first stage of the drilling programme. Standard equipment was not adequate and much core was lost. Subsequently the core was discarded. Mr. D. A. Barr of Kennecot re-logged this core before it was discarded, however, and the records of assays and geology are available and have been used in this report. Collar elevations for the holes 1-27 and D-1 are not accurate. All holes are shown on the plan of diamond drilling and horizontal sections at 50-foot spacing accompanying this report.

The holes numbered 1-65 to 2-66 were drilled with modern equipment and core recovery was excellent. The work was contracted with Canadian Longyear Ltd. B.Q. Wireline, swivel core barrel, stepped bits and mud were used.

A description of the results obtained by North Pacific Mines from diamond drill holes 1-65 to 8-65 inclusive, is in the writer's opinion, representative of the Krain deposit, although subsequent drilling, 9-65 to 1-66 and 2-66 holes partially outlined the zone and when within same acquired similar results.

Hole #1-65 Located within the indicated zone, near the northeast margin, and directed southwest at minus 60 degrees.

The first 53 feet penetrates road fill accumulated during the site preparation, but for this distances it is close bedrock of the steep sidehill which grades close to 1 % copper.

From	To	Length, feet	Average % Copper
53	140	90	0.75
140	240	100	0.48
240	300	60	0.45
300	400	100	0.61
400	500	100	0.45
500	585	85	0.25

From bedrock to the bottom of the hole, a length of 535 feet, the average grade is 0.518 % copper. If the top 450 feet is considered the grade is 0.567 % copper.

Hole #2-65 Located 300 feet southwest of hole #1, and drilled vertically to a depth of 1,516 feet. Similar to hole #1, it is collared very close to the nearly vertical wall of the hillside, close to the portal of prospect adit #2, and although it passes through 40 feet of road fill before encountering bedrock, there is 55 feet of material grading better than 1 % copper a few feet away and parallel to the hole.

From	To	Length, feet	Average % Copper
40	160	120	0.92
160	360	200	0.48
360	500	140	0.30
500	700	200	0.15
700	900	200	0.46
900	1000	100	0.40
1000	1100	100	0.34
1100	1200	100	0.48
1200	1400	200	0.33
1400	1516	116	0.21

The entire 1,476 feet of this hole averages 0.40 % copper. The top 320 feet averages 0.65 % copper. Molybdenite content was checked by 50-foot composite samples for the full hole length which averaged 0.036 % MoS_2.

Silver content was checked by 7 composites of 50 feet each, from 1150 to bottom, which averaged 0.18 ounces silver per ton.

Hole #3-65 Located 250 feet southeast of hole #2, and drilled vertically to a depth of 1,113 feet. For the first 45 feet the hole passed through overburden, and to 290 foot depth through silicified and pyritized bedrock that contains minor chalcopyrite.

From	To	Length, feet	Average % Copper
45	290	245	0.13
290	790	500	0.45
790	1113	323	0.21

For molybdenum and silver 50-foot composite samples were assayed, as follows:

From 45 to 290, MoS_2 0.036 % Ag 0.27 ounces per ton
500 to 1113, MoS_2 0.011 % Ag 0.24 ounces per ton

Hole #4-65 Located 172 feet southwest of hole #1 and drilled vertically to 605 feet. The hole was lost because of mechanical difficulties, just before entering the well mineralized zone in Hole #6.

From	To	Length, feet	Average % Copper
0	23	Overburden	-
23	150	127	0.69
150	250	100	0.35
250	500	250	0.56
500	605	105	0.41

This hole averages 0.53 % copper. For molybdenum and silver, 50-foot composite samples averaged,

MoS 0.014 % Ag 0.27 ounces per ton

Hole # 5-65 Located 141 feet northeast of hole #3, and drilled vertically to a depth of 977 feet. Similar to #3 hole it passes through 85 feet of silicified and pyritized zone before encountering the copper mineralization.

From	To	Length, feet	Average % Copper
0	75	Overburden	-
75	100	85	0.13
160	200	100	0.59
260	400	140	0.39
400	500	100	0.57
500	600	100	0.61
600	700	100	0.49
700	800	100	0.46
800	977	177	0.20

From a length of 640 feet, from 160 to 800, this hole averaged 0.51 % copper.

For molybdenum and silver, eighteen 50-foot composite samples assayed MoS_2 0.038% and Ag 0.18 ounces per ton.

Hole #6-65 Located 50 feet southwest of hole #1, and drilled vertically to 930 feet.

From	To	Length, feet	Average % Copper
0	14	Overburden	-
14	240	226	0.60
240	540	360	0.26
540	740	200	0.71
740	930	190	0.20

For a length of 726 feet, from 14 to 740, this hole averaged 0.49 % copper.

For molybdenum and silver, 19 composites of 50-feet each, averaged MoS 0.031 % and Ag 0.24 ounces per ton.

Hole #7-65 Located 138 feet northeast of hole #5, and drilled vertically to 770 feet.

From	To	Length, feet	Average % Copper
0	59	Overburden	-
59	130	71	0.20
130	200	70	0.47
200	500	300	0.35
500	600	100	0.36
600	770	170	0.18

For molybdenum and silver 13 composites, of 50-feet each, averaged MoS_2 0.04 % and Ag 0.10 ounces per ton.

Hole #8-65 Located 421 feet southwest of hole #1, and drilled vertically to a depth of 1,211 feet.

From	To	Length, feet	Average % Copper
0	4	Overburden	-
4	170	176	0.17
170	300	130	0.51
300	500	200	0.41
500	1211	911	0.27

For molybdenum and silver, 19 composite samples of 50-feet each, averaged MoS_2 0.023 % and Ag 0.30 ounces per ton.

The following descriptive notes are pertinent to the assay results as tabulated.

Holes 1, 2, 4, 6 and 8 were drilled across the indicated zone of mineralization along a NE - SW line. Hole 1 was 50 feet within the zone near the northeast boundary, and hole #8, 125 feet outside the southwest boundary. Hole #1 was all within the indicated zone, and should be representative of this to at least

500 feet of depth, grading over 0.5 % copper. Hole #4 was a check on this section of the zone, averaging 0.53 % copper to 600 feet when the drilling was unfortunately terminated because of a ground difficulty which resulted in loss of bit, corebarrel and 40 feet of rods jammed in the bottom of the hole. This was particularly unfortunate because hole #6, just over 100 feet away passed through mineralization grading .71 % copper to a depth of 150 feet below the bottom of #4 hole, and #2 hole 120 feet on the other side continued in 0.43 % copper mineralization 900 feet deeper than the bottom of hole #4. Hole #2 was the most productive of the eight holes completed. The top 320 feet graded 0.65 % copper. A dyke containing low grade mineralization was then encountered, which is not considered as thick as the penetrated distance represents since the hole intersects the dyke at an acute angle. However, if this lower grade material is included in the grade calculation for the next 200 feet, the average grade is 0.5 % for the full 570 feet of hole. One hundred and seventy feet of low grade lies below the dyke, but for the lowest 816 feet of hole the grade is 0.43 % copper, with two sections grading well above 0.5 %.

Hole #6 graded 0.6 % copper for 220 feet, passed through 360 feet of 0.26 % material which may represent the edge of the mineralized zone at that location, then encountered 200 feet of 0.71 % copper. The average in this hole for these three sections is 0.47 % copper over a depth of 780 feet.

Hole #8, outside the indicated zone passed through an

iron stained oxidized zone of low grade before entering the copper bearing zone grading 0.45 % copper for 330 feet. This hole, like 1, 2 and 4 showed finely disseminated bornite throughout most of the mineralized section.

Holes 3, 5 and 7 are along a parallel line to the above, that is 250 feet to the southeast across the indicated zone of mineralization in a northeast - southwest direction. This section is capped by silicified rock containing iron pyrite but little chalcopyrite. Beneath this capping hole #3 cut 500 feet of 0.45 % copper to a depth of 750 feet. Also hole #5 cut 700 feet of 0.5 % copper to a depth of 800 feet.

Hole #7 cut 70 feet of 0.47 % copper and 400 feet of 0.35 % copper, or 470 feet grading 0.36 % copper to a depth of 600 feet.

Diamond drill hole 2-66 was located on the volcanic capping and drilled through the rubble on the old land surface below the volcanic material into the Krain deposit. This demonstrated the extension of the zone below the volcanic capping to that point. Loose ground resulted in loss of bit, core barrel and some rods in the bottom of the hole, necessitating abandonment. The bottom 27 feet of hole, however, penetrated brecciated quartz diorite and assayed as follows:

2-66

Depth Feet	Core Recovery %	Copper %	Copper Oxide %
203-210	95	0.15	0.001
210-220	95	0.30	0.03
220-230	95	0.58	0.27

Hole lost at 235 feet because of jammed equipment.

10. PERCUSSION DRILLING

Scout holes were drilled over a considerable area with Overburden Percussion equipment under contract with C. F. Miller.

The purpose of this drilling was twofold. First, it was necessary to ascertain the nature and indicated mineral content of bedrock to the south and east of the Krain deposit as presently known. Second, it was considered possible that this equipment could better test the extension of the mineralized zone under the volcanic capping. Grade data was not anticipated to be accurate and no attempt has been made to evaluate same from the percussion drilling. By examination under the binocular microscope the chips could be identified and the amount and type of sulphide material present could be roughly estimated. Notwithstanding, the cuttings were collected for every 10-feet of hole where bedrock was encountered, and these were split and assayed. The results of assays are as herein included on the following page.

The following Percussion Holes were completed.

No.	Location	Depth, Overburden, Feet	Depth, Volcanics, Feet	Length Feet
1	2400N 650E	40	-	150
2	4000N 50E	50	-	90
3	4200N 175E	30	-	120
4	4380N 60E	30	-	260
5	3600N 80E	40	-	300
6	3600N 600E	30	-	280
7	2975N 920E	40	-	40
8	3150N 770E	18	-	290
9	2830N 450E	5	-	120
10	2830N 100E	5	-	120
11	5570N 950E	-	40	40
12	5450N 770W	-	35	35
13	5750N 800W	-	80	80
14	5940N 680W	-	110	110
15	5420N 510W	-	40	220
16	4200N 1000W	-	-	160
17	3150N 150E	18	-	230
			Total	2,645

The samples from the Percussion Holes are as follows:

	FOOTAGE	ASSAYS % Cu
Hole #1	40-50	0.20
	50-60	0.11
	60-70	0.10
	70-80	0.10
	80-90	0.17
	90-100	0.20
	100-110	0.16
	110-120	0.09
	120-130	0.08
	130-140	0.12
	140-150	0.12
Hole #2	50-60	0.10
	60-70	0.10
	70-80	0.09
	80-90	0.10
Hole #3	30-40	0.12
	40-50	0.11
	50-60	0.08
	60-70	0.07
	70-80	0.07
	80-90	0.08
	90-100	0.10
	100-110	0.08
	110-120	0.11
Hole #4	20-30	0.18
	30-40	0.18
	40-50	0.17
	50-60	0.16
	60-70	0.22
	70-80	0.23
	80-90	0.33
	90-100	0.20
	100-110	0.21
	110-120	0.20
	120-130	0.19
	130-140	0.17
	140-150	0.16
	150-160	0.17
	160-170	0.13
	170-180	0.15
	180-190	0.13
	190-200	0.10
	200-210	0.11
	210-220	0.13
	220-230	0.11
	230-240	0.11
	240-250	0.15
	250-260	0.17

	FOOTAGE	ASSAYS % Cu
Hole #5	40-50	0.17
	50-60	0.13
	60-70	0.17
	70-80	0.13
	80-90	0.27
	90-100	0.10
	100-110	0.28
	110-120	0.22
	120-130	0.23
	130-140	0.19
	140-150	0.18
	150-160	0.14
	160-170	0.17
	170-180	0.25
	180-190	0.17
	190-200	0.20
	200-210	0.18
	210-220	0.16
	220-230	0.17
	230-240	0.14
	240-250	0.15
	250-260	0.16
	260-270	0.22
	270-280	0.11
	280-290	0.14
	290-300	0.20
Hole #6	30-40	0.14
	40-50	0.17
	50-60	0.11
	60-70	0.14
	70-80	0.16
	80-90	0.12
	90-100	0.23
	100-110	0.21
	110-120	0.18
	120-130	0.22
	130-140	0.19
	140-150	0.11
	150-160	0.11
	160-170	0.10
	170-180	0.09
	180-190	0.09
	190-200	0.07
	200-210	0.07
	210-220	0.07
	220-230	0.07
	230-240	0.07
	240-250	0.07
	250-260	0.09
	260-270	0.08
	270-280	0.07

	FOOTAGE	ASSAYS % Cu
Hole #8	20-30	0.07
	30-40	0.09
	40-50	0.07
	50-60	0.06
	60-70	0.07
	70-80	0.08
	80-90	0.13
	90-100	0.09
	100-110	0.09
	110-120	0.14
	120-130	0.09
	130-140	0.07
	140-150	0.10
	150-160	0.20
	160-170	0.09
	170-180	0.07
	180-190	0.11
	190-200	0.10
	200-210	0.10
	210-220	0.20
	220-230	0.17
	230-240	0.16
	240-250	0.10
	250-260	0.09
	260-270	0.11
	270-280	0.14
Hole #9	5-20	0.17
	20-30	0.13
	30-40	0.11
	40-50	0.09
	50-60	0.16
	60-70	0.19
	70-80	0.19
	80-90	0.13
	90-100	0.10
	100-110	0.20
	110-120	0.19
Hole #10	5-20	0.10
	20-30	0.06
	30-40	0.06
	40-50	0.10
	50-60	0.07
	60-70	0.10
	70-80	0.07
	80-90	0.07
	90-100	0.04
	100-110	0.07
	110-120	0.07

	FOOTAGE	ASSAYS % Cu
Hole #15	5-20	0.05
	20-30	0.06
	30-40	0.07
	40-50	0.08
	50-60	0.14
	110-120	0.10
	120-130	0.12
	130-140	0.30
	140-150	0.06
	150-160	0.10
	160-170	0.10
	170-180	0.11
	180-190	0.11
	190-200	0.16
	200-210	0.25
	210-220	0.22
Hole #16	5-20	0.11
	20-30	0.11
	30-40	0.13
	40-50	0.11
	50-60	0.11
	60-70	0.13
	70-80	0.10
	80-90	0.10
	90-100	0.10
	100-110	0.10
	110-120	0.10
	120-130	0.10
	130-140	0.12
	140-150	0.11
	150-160	0.12
Hole #17	20-30	0.07
	30-40	0.07
	40-50	0.10
	50-60	0.11
	60-70	0.11
	70-80	0.16
	80-90	0.14
	90-100	0.14
	100-110	0.11
	110-120	0.15
	120-130	0.10
	130-140	0.28
	140-150	0.14
	150-160	0.12
	160-170	0.14
	170-180	0.13
	180-190	0.14
	190-200	0.12
	200-210	0.15
	210-220	0.14
	220-230	0.14

The results of the percussion drilling demonstrate that, to the south and east of the Krain showings there is widespread near surface copper mineralization. The near surface part of the deposit, where cut by diamond drill holes 3-65, 5-65 and 7-65 showed somewhat similar characteristics and lower down the main copper-molybdenum mineralization was encountered. It is believed, therefore, that the percussion drilling clearly indicates the necessity of a major core drilling programme on this indicated extension of the Krain mineralized zone.

11. GEOCHEMICAL SURVEYS

Silt samples were taken from all streams in 1957 by Northwestern Exploration. This was followed up by soil sampling on lines 400 feet apart along which samples were taken at 100 foot intervals. Thirty-four line miles were so sampled and all samples were tested in the laboratory by the cold citrate extraction and dithizone titration method for copper. Results were recorded in parts per million, copper.

The plan accompanying this report shows only those sample results with 12 or more parts per million.

Anomalous areas were trenched to expose bedrock where possible. Copper mineralization was encountered in all exposures, often as staining associated with fractures. No rock trenching or drilling has been used to check these occurrences to date.

12. MAGNETOMETER SURVEY

A magnetometer survey was conducted over the property by Northwestern Exploration Co. in 1957 and 1958.

Areas of lower than normal magnetic intensity are considered anomalous because of the nature of the two rock types, as follows.

The Guichon quartz diorite normally contains some magnetite. Where altered and mineralized, however, the magnetite has been removed by the mineralizing action and the zone registers below normal.

The quartz diorite porphy has no magnetite in it, and it is a favorable rock type for copper mineralization.

An anomaly about a mile north of the Krain workings was stripped and found to be a quartz feldspar porphyry dyke in weathered older quartz diorite but only hematite mineralization was exposed.

The volcanic contact was outlined due to the basalt having a measureable magnetite content.

The anaomaly on the DW 4 claim was drilled and found to contain low copper mineralization in younger quartz diorite and porphyry.

Areas of low magnetic intensity are shown on the map of the mineralized zone accompanying this report.

13. INDUCED POLARIZATION AND RESISTIVITY SURVEYS

Induced polarization and resistivity surveys were conducted by McPhar Geophysics Limited over the property in 1957 and 1958. Nineteen and one half miles of line was completed using 200 to 500 foot dipole spacing along lines 400 feet apart.

Direct current resistivity measurements were compared with alternating current measurements, and where the latter were low metallic mineralization was considered to be indicated.

The Krain deposit was outlined on the basis of metal factor values. Additional weakly anomalous zones were detected. All are shown on the map accompanying this report.

The conclusions reached by the geophysicists were that the anomaly pretty well outlined the mineralized zone on the Krain, with a suggested dip to the west, and that little or no additional mineral zones were indicated.

Since 1958 equipment improvements have been such that it is now considered necessary to re-survey all or part of the Krain property by the induced polarization method.

14. TONNAGE AND GRADE ESTIMATES

The following is a summary of tonnage and grade estimates on the Krain mineralized zone as investigated to date.

CATEGORY	VERTICAL RANGE FEET	NUMBER OF 50-FOOT HORIZONTAL SECTIONS	CONVERSION FACTOR CUBIC FEET TO TONS	CUT OF GRADE	ESTIMATED TONS	ESTIMATED GRADE % Cu
Drill-proven	5,700 to 4,800	18	12.5	±0.2	20,023,574	0.4514
Probable	Same	18	12.5	-	60,550,000	-

No tonnage is estimated in the possible category. It is unknown and will depend upon development of probable reserves to the north and southeast and to the west at depth.

The 20,023,574 tons of 0.4514 % copper is placed in the drill-proven category for the following reasons.

1. From extensive studies of most of the drill core the writer is impressed with the uniformity of the mineralization throughout the zone investigated to date.
2. The tonnage estimates are controlled by grade, and in the opinion of the writer the grade figures are conservative, because of the following reasons.
   (a) Experience has shown that, by the friable nature of the copper sulphides, the numerous small aggregates tend to fragment when cut by the drill bit, broken and abraded by movement of the drill equipment and when split for sampling. Hence some mineral is always lost, and the assays tend to be below true value.
   (b) Some angle holes, such as 1-65 cut lower grade

dykes at such an angle as to include considerably more low grade core in the hole than the actual influences the dyke has on the overall grade. Also in holes such as 13-65, where a fault or intersection of two faults, was followed the entire length of the hole in highly fragmented and leached material. This low grade material is almost certainly restricted in lateral extent, but the low influence of this hole cuts out probably 100,000 tons from each 50-foot section.

3. In general the radius of influence the holes represent is about 100 feet, which in the opinion of the writer, in the Krain type of mineralization is well within the requirements for the drill-proven category.

The 60,550,000 tons is placed in the probable category for the following reasons.

1. The blocks represented by sections 5,400 and 5,450 are within the influence of near surface, and are penetrated by all drill holes.
2. These blocks are just under the pyritized capping, and holes 3-65; 5-65 and 7-65 are within the normal copper-bearing mineralized zone.
3. Above these blocks the surface cuts into and quickly reduces the available mineralized material; whereas below these levels the lack of data -- by virtue of insufficient drilling to depth--precludes including the apparent full

mineralized zone within the drill-proven category, although the deep holes indicate no change in the zone of mineralization except possibly for the better, to the 4,800 level at least.

4. Hole 2-65 appears to represent the center of the long axis of the outlined mineralized zone; the point where the strike of the axis turns from northwest to north. From this point it is considered reasonable to project the mineralized zone north a distance equal to the distance from hole 2-65 to the northern boundary of the zone as outlined by the polygons of holes 4 and 21-65. Similarly to the southeast if the zone is projected the distance from 2-65 to 26 it reaches the surface contour, and along with the knowledge that the area is mineralized, by virtue of drill results of widely scattered holes, this block is estimated to be within the category of probable reserves.

5. The two blocks represented by sections 5,450 and 5,400 are judged to be representative of the mineralized zone as outlined to date. Hence, this 100-foot thick block is estimated to contain 4,547,407 tons, or about 45,474 tons of drill-proven reserves per foot of depth. Likewise the estimated probable tonnage is 4,700,000 tons or 47,000 tons per foot of depth.

The individual blocks are estimated to contain the following tonnages and grades.

SECTION	PROVEN TONS 2,000 lbs.	PROVEN GRADE % Copper	PROBABLE
5,700	62,832	0.6500	
5,650	354,404	0.5050	
5,600	1,266,896	0.5226	300,000
5,550	1,408,676	0.4863	700,000
5,500	1,353,043	0.4914	2,000,000
5,450	2,039,931	0.4547	2,200,000
5,400	2,507,479	0.4769	2,500,000
5,350	2,022,588	0.4392	2,850,000
5,300	1,659,945	0.4284	4,000,000
5,250	1,490,911	0.4399	4,250,000
5,200	1,424,275	0.4173	4,500,000
5,150	1,011,976	0.4266	4,750,000
5,100	925,531	0.4276	5,250,000
5,050	1,159,831	0.3337	5,250,000
5,000	469,664	0.4379	5,500,000
4,950	213,420	0.5673	5,500,000
4,900	333,072	0.5316	5,500,000
4,850	292,000	0.3991	5,500,000
	20,023,974	0.4514	60,550,000

The polygon method was used for calculating the tonnages and grades as follows.

1. Horizontal sections are drawn through the drilled mineralized zone. On the Krain the sections start at elevation 5,700 and continue down to 4,850.
2. On each section, which represents a block 50 feet thick, all data pertaining to penetration points of holes or other openings are located. The weighted average grade of all holes for the section level and 50 feet below are calculated and noted on the plan.
3. Each hole is joined to the nearby holes on the plan creating a series of triangles.
4. The apex of each triangle (a hole location) is joined by a line to the center of the opposite side of the triangle and the point of intersection represents the center of the triangle.
5. In each triangle there are thus formed three sets of small triangles, each set representing the "area of influence" of the hole forming the common apex of the set.
6. Thus a polygon is formed around each hole and the area of this polygon represents the "area of influence" of the hole in relation to neighboring holes.
7. The block has a uniform thickness of 50 feet, hence the size of the polygon represents the relative "weight of influence" exerted by each hole. The weight in tons is calculated by multiplying the area by 4, since 12.5 cubic

feet per ton is used for the conversion factor and the thickness is 50 feet.

8. The total tonnage of each block is the total of the polygon shaped blocks, and the average grade is calculated by multiplying the tonnage by the grade of each, adding these and dividing by the total tonnage.

The plans of surface and sections down to and including 4,800 are included with this report as drawing numbers K-4 to K-23 inclusive. Where calculated tonnage is shown for a polygon, that block is considered "drill-proven" and is included in the tonnage and grade figures shown near the lower right corner of the sheet. Also included on many sheets are the averages of silver and MoS_2 assays for that block. Only some sections of some holes were assayed for silver and MoS_2, and the figures shown do not represent complete weighted averages, since no silver or MoS_2 samples were assayed from holes 9-65 to 14-65 inclusive, 19-65, 22-65 and 1 to 28 inclusive. Explanatory notes pertaining to the sections are as follows.

1. Elevation 5,700

The section is just skimming the surface, and is penetrated by a small creek valley. All the holes but number 3 are in overburden or just penetrating bedrock and data pertaining to grade is not applicable to the 50-foot block represented by the plan. No calculated tonnage and grade are shown on the plan, but hole 3 cut oxidized material grading 0.65 % copper, and at the next section below it assayed 0.80 %

copper. Hence a portion of the block represented by the polygon on section 5,650 is considered drill-proven, and 62,832 tons grading 0.65 % copper are included in the list of drill-proven reserves.

2. Elevation 5,650

Surface workings are included in this block and the grade is influenced appreciably. The calculated tonnage mineable from this block is obviously conservative. The section at the bottom of the block is about three times as large because of the gently sloping land surface and receding influence of the volcanic cover (the base of the volcanic cover slopes steeply upwards to the north and northwest).

3. Elevation 5,600

This 50-foot block is over 1,000,000 tons, and the grade is influenced by data available from the adit tunnels. The ground slope is just below the section level on the south-east and a small rise on which hole 22 is located penetrates the section. The probable tonnage lying between this and the 5,550 level is estimated at 300,000 tons.

4. Elevation 5,550

Many holes have passed through overburden, road fill and leached surface rock, and at this level such holes as 1,2,1-65, 4-65, 6-65, 12-65, 14, 18, 19 and 2-66 are showing an influence on tonnage and grade. Holes 3-65 and 7-65 penetrate the section but are in the pyritized capping which is low grade, and although valuable for the pyrite content, show an adverse affect

on tonnage and grade estimates for this block. Hole 2-66 has penetrated the mineralized zone below the volcanics, and this along with hole 18-65 demonstrates the strength of mineralization and swing in direction from northwesterly to northerly. It is considered reasonable, therefore, to extend the probable zone 250 feet northerly. The southwest portion of the block to the surface, penetrated by holes 3-65, 7-65, 8-65, 22, 23 and 25, is also included in the probable category, some of this being pyritized material which will be valuable for acid generation if treatment by heap leaching is used.

5. Elevation 5,500

The influence of holes 18-65 and 2-66 have been lost but the strong northerly trend is maintained by holes 4 and 21-65, supporting the allowance of a sizeable block in the probable category.

The southeasterly continuance of the zone to the surface is maintained in the probable category by virtue of holes 23, 25, 3-65, 5-65, 7-65, 10-65, and more particularly holes 26 and 27 which have penetrated the block.

6. Elevations 5,450 and 5,400

The 100-foot thick block represented by these two sections is considered representative of the deposit outlined to date.

The northern extension shows strength because of the influences of holes 4 and 21-65.

Holes 3-65, 5-65 and 7-65 are through the pyritized cap and show mineralization representative of the mineralized zone

The strength of holes 26, 27 and 16-65, and the indicated mineralization shown in percussion holes 2, 3 and 4 is considered sufficient to extend the zone of probable tonnage 450 feet to the surface.

The block as outlined represents drill-proven tonnage of 45,000 tons per foot and probable tonnage of 47,000 per foot of depth.

7. Elevation 5,350

This section is in the same category as 5,400, and maintains tonnage and grade close to average for the deposit as developed to date.

8. Elevation 5,300

Hole 10-65 has fallen below acceptable grade, hole 6-65 is entering a low grade section, and hole 11-65 is somewhat lower in grade; all contributing to a drop in grade and tonnage at this level.

9. Elevation 5,250

Holes 21-65 and 15-65 maintain good grade and indicate good extension possibilities to the north. Hole 6-65 has penetrated a low grade section and thereby exerts a downward influence on tonnage and grade.

Holes 3-65; 5-65, and 7-65 are in average grade material.

Holes 16-65; 27-65 and percussion hole 4 indicate good extension possibilities to the southeast.

10. Elevation 5,200

Hole 21-65 has bottomed in 0.45 % copper, the influence of it to the north is lost, and this coupled with hole 6-65 being still in a low grade section reduces the tonnage. Hole 17-65 is coming into better grade which shows no effect directly on the section, but taken into consideration with 21-65, the northerly extension possibilities are excellent at this level. The south-easterly extension possibilities are maintained by holes 16-65; 27 and 28.

11. Elevation 5,150

At this level, the deep holes such as 3-65, 4-65, 5-65, 7-65 are holding grade, indicating continuity of the mineralized zone in grade and extent.

12. Elevation 5,100

Hole 6-65 has entered good mineralization. Holes 3-65, 5-65 and 7-65 are in excellent grade material and 7-65 has cut 50 feet of 0.43 % MoS_2.

13. Elevation 5,050

Similar to section 5,100. Hole 10-65 has bottomed in 0.30 % copper.

14. Elevation 5,000

A drop in tonnage is caused by holes 7-65 and 8-65 entering lower grade material.

15. Elevation 4,950

A drop in tonnage caused by a lowering of grade in hole 2-65, but compensated by a raise in grade in hole 6-65 to 0.80 % copper.

16. Elevation 4,900

Similar to section 4,950, with hole 6-65 in 1.09 % copper.

17. Elevation 4,850

This carries to elevation 4,800 with little change in the six holes at this depth. Drilling was continued to the 4,060 level with hole number 2, and the weighted average grade for the bottom 740 feet was 0.344 % copper, which indicates continuity of mineralization.

15. EXPLORATION TARGETS

As a major drilling programme progresses, the location of sucessive holes may be continguent upon results of holes being drilled or recently completed. Rather than detail the extensive drilling pattern at this time, therefore, the target areas will be listed in order of priority.

AREA NO. 1

The northerly extension under the volcanic cap. Extend to depth, holes 18-65 and 2-66, or drill new holes adjacent to them. The volcanics are believed to lie on an irregular rubble-covered old land surface. The average thickness of the basalt and tuff is not believed to be great and drill site locations may be partly decided on the basis of this factor, provided the thickness can be estimated by siesmic or other methods.

It may be practical to drill some angle holes, probably several from one drill site. It may be necessary to combine percussion drilling and core drilling to pierce the volcanic cover effectively.

It will be necessary to attain penetration to the 4,800-5,000 level in at least two holes.

AREA No. 2

The western extension of the mineralized zone has intriguing possibilities. No probable tonnage has been allowed for this area, but it falls within the possible category. Holes 17-65 and 20-65 penetrated 350 to 400 feet of low grade mineralization before reaching the normal copper-bearing zone. The bottom 400 feet of hole 17-65 contained consistently good MoS_2 mineralization and good sections of bornite. Also bornite was found in hole 20-65.

Hole 22-65 was abandoned at a depth of 163 feet in Guichon quartz diorite. This hole should be deepened, or a new hole

drilled close by, to the 4,800-5,000 elevation.

Additional holes should be drilled to check and trace the possible westerly extension of the zone.

This work can be carried on at the same time target number one is drilled, because the old induced polarization survey indicated an extension west at depth and it will not be necessary to resurvey the area before drilling.

AREA No. 3

The southeastern extension of the mineralized zone requires checking first by a detailed induced polarization survey and then by a pattern of vertical holes 400 to 500 feet deep. In addition to drilling the zone outlined in the probable category, the area to the southeast where percussion drilling indicated excellent possibilities should be core drilled. Also, the area due east of the mineralized zone which has not been checked by percussion drilling, must be investigated by core drilling after being re-surveyed by induced polarization.

AREA No. 4

The area influenced by hole 13-65 must be checked, possibly by one or more angle holes, to ascertain the nature and extent of the low-grade gap in the mineralized zone there indicated.

AREA No. 5

Outlying zones with favorable indications, such as the area

around the copper stained and strongly fractured younger quartz diorite porphyry on the DW 4 claim, should be re-surveyed with induced polarization equipment and probably core drilled.

16. METALLURGIAL TESTS

In 1965 research was started by Britton Research Laboratories of Vancouver on oxidized material from the Krain. A representative sample was carefully selected from surface showings, the adit tunnels, and drill sample rejects. The head assays of the sample were as follows:

Copper	0.50 %, of which 52 % was oxides
Silver	0.06 ounces per ton
Gold	0.001 ounces per ton
MoS_2	0.010 %
Iron	3.03 %, acid soluble
Sulphur	0.08 %, sulphate, 0.02 %

Three methods for the recovery of copper from the oxidized material were tested, namely,

Direct Flotation
Leach - Precipitation - Flotation
Acid - Leach - Filtration

Direct flotation was found to be ineffective.

Acid-leach-filtration was not practical because of indicated high acid consumption and low copper recovery.

Acid leaching, followed by direct precipitation by iron, followed by flotation of the precipitate resulted in 75 % recovery of the copper and a 35 % copper concentrate. Although acid

consumption was indicated to be high, the availability of iron from the pyritized zone on the surface of the Krain deposit indicated an improvement could be attained by further research. Field tests by heap leaching were recommended.

Preliminary test work indicates that 75 % of the copper contained in the oxidized material may be recovered but there are possibilities of increasing this recovery and lowering the cost of same by heap leaching and field tests are recommended.

17. ECONOMIC CONSIDERATIONS

The Krain property is favorably situated near a producing open pit mine.

Drilling has partially outlined a mineralized zone which is estimated to contain 20,000,000 tons of "drill-proven" material grading 0.45 % copper along with as yet undetermined amounts of silver and molybdenite, although preliminary sampling indicates grades in the range of 0.2 ounces of silver per ton and 0.02 % MoS_2. Extensions to the north and southeast are estimated to contain in the "probable" category 60,000,000 tons of undetermined grade. In addition explorations targets point to additional tonnage in the "possible" category.

A major diamond drilling programme is recommended, as well as bulk sampling underground and pilot mill tests, to supply the necessary data for a feasibility study. In the meantime the bulk of well documented data is considered sufficient for

preliminary estimates of the possible profit potential for an open pit operation on the Krain as follows.

1. Assume that future prices for copper and silver will be 40 cents per pound and $1.40 per ounce respectively.
2. Assume an overall 90 % recovery for the copper and silver, and the profit potential of the molybdenum and gold a safety fund to take care of future contingencies uncalculable at this time.
3. Assume that a considerably greater tonnage will be developed, warranting a sizeable open pit operation, in the 10,000 ton per day range.
4. Assume a 2 : 1 waste to ore ratio will be maintained.
5. The estimated value of the copper and silver per ton is as follows:

Copper: 0.45 (20) (90) (0.40)	$ 3.24
Silver: 0.20 (90) (1.40)	.25
	$ 3.49

6. The estimated costs of production per ton are as follows.

Mining: 20¢ per ton	$ 0.60
Milling:	0.75
Services:	0.08
Administration:	0.12
Marketing, transportation, smelting and refining:	0.64
	$ 2.19

7. Estimated operating profit per ton

$3.49 - $2.19:	$ 1.30

18. SUMMARY AND CONCLUSIONS

The Krain property is located in the Highland Valley considered to be one of the most favorable areas in British Columbia for low-cost open pit mining. It is a few miles from the Bethlehem open pit mine and sufficiently close to Ashcroft to benefit from good transportation, the availability of all services and employee living facilities.

Exploratory and development work completed to date includes serval thousands of feet of trenching, numerous open pits, two short adit tunnels, 25,146.5 feet of diamond drilling, 2,645 feet of percussion drilling, geochemical, magnetometer and induced polarization surveys and detailed geological mapping.

Preliminary laboratory research indicates that the oxidized tonnage may be successfully treated and that the possibilities of improving same by field tests are excellent. No difficulty is anticipated concentrating the unoxidized material because of experienced gained at the Bethlehem operation.

Estimated reserves on the partially outlined deposit are 20,000,000 tons grading 0.45 % copper in the drill-proven category and in the probable category 60,000,000 tons of unestimated grade. No tonnage estimates have been made in the "possible" category but several excellent target areas are expected to respond favorably to development thereby adding to the tonnage reserves.

It is herewith concluded that the Krain property warrants a major development programme.

19. RECOMMENDATIONS

It is herewith recommended that a major development programme be undertaken as soon as possible on the Krain property. Largely because of weather, which makes conditions unfavorable for conducting induced polarization surveys at this time of year, the works programme is divided into two schedules, the first which may be started immediately and followed by the second after the spring break-up.

SCHEDULE 1	Estimated Costs
1. Diamond drill the northern extension of the mineralized zone below the volcanic cover. About 10 holes totaling 8,000 feet estimated to cost $12.00 per foot	$ 96,000.00
2. Diamond drill the western extension of the mineralized zone below the low-grade quartz diorite cover. About 6 holes totaling 5,000 feet estimated to cost $10.00 per foot	50,000.00
3. Conduct on site heap leaching tests with selected oxidized and pyritized material	20,000.00
4. General, offices, and overhead	20,000.00
5. Contingencies fund	14,000.00
Estimated Costs	$ 200,000.00

SCHEDULE 2	
1. Conduct induced polarization surveys over selected areas of the property	$ 10,000.00
2. Diamond drill the southeastern extension of the mineralized zone About 15 holes amounting to 10,000 feet estimated to cost $10.00 per foot	100,000.00

		Estimated Costs
3.	From an advantageous location, east of the workings at about the 5,350 elevation, drive an adit tunnel northwest by west to the general location of hole 2-65, and then northerly to the northern boundary of the mineralized zone. Crosscut to the southwest and northeast boundaries from two selected locations. This will require about 3,000 feet of 6 by 8-foot tunnel, estimated to cost about $30.00 per foot.	$ 90,000.00
4.	Diamond drill underground from the tunnel to supply needed information	25,000.00
5.	Construct a suitable pilot plant and conduct mill tests for the recovery of copper, silver and molybdenum from the newly mined mineralized material from the tunnel workings.	$ 40,000.00
6.	General, offices and overhead	20,000.00
7.	Contingencies fund	15,000.00
		$ 300,000.00

The total estimated cost of the recommended works programmes is $500.000.00. It is estimated that a budget of $50,000.00 per month will be required for 10 months to complete the work.

K. THE DANSEY PROPERTY

1. INTRODUCTION

The Dansey property for the purposes of this report is defined as the two groups of claims near the Krain property held by North Pacific Mines. One small group lies to the northwest and the other large group extends eight miles to the southeast. The Dansey mineralized zones are near the southeast end of the property, on the JB group which was acquired from C. W. Dansey June 1, 1964. Practically all the work has been concentrated on a one mile square area within which copper-molybdenum mineralization occurs under faborable geological conditions. Although the remainder of the claims have been prospected and a geochemical survey was made over the REZ claims this report is confined to detailing the work done on the Dansey showings.

The report is based upon examination of the property by the writer and supervision of all field work thereon during the 1964-65 seasons.

2. LOCATION AND ACCESSIBILITY

The two groups of claims comprising the Dansey property are located near the Krain in the Highland Valley of British Columbia. One small group is one and one half miles west and the large group extends from one mile southeast of the Krain seven miles southeast to Guichon Creek.

Access from Ashcroft is via the paved Bethlehem road to Little Divide Lake and from there easterly to a turn-off one mile past the Bethlehem landing strip, and thence by secondary road through the BX property to the Dansey showings. A second route is via secondary road, across Guichon Creek one mile to the property from the Savanah road $2\frac{1}{2}$ miles west of the junction with the Highland Valley road.

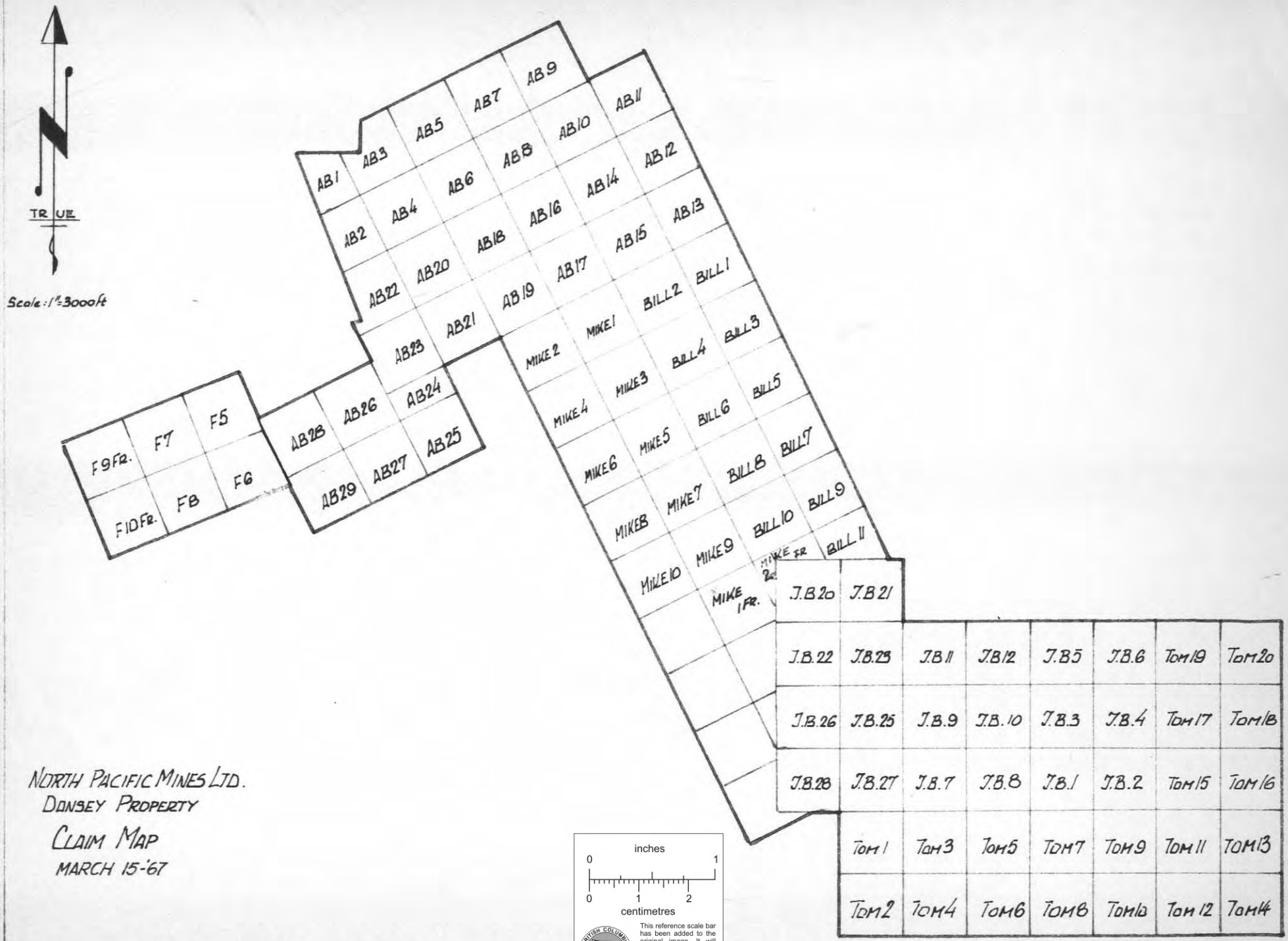
3. HISTORY

Copper-molybdenum mineral showings were worked in the early prospecting days of the Highland Valley, probably around 1900 to 1905. Rock trenches and a short adit tunnel exposed pyrite and chalcopyrite in strong shear zones but the gold content was low so very little work was done. In 1962 and 1963 C.W. Dansey exposed high grade copper mineralization in the vicinity of the old prospect tunnel. In 1964 North Pacific Mines acquired the property and during that year and 1965 carried on with exploratory work.

4. PROPERTY

The Dansey property is divided into two groups of mineral claims as follows:

Group 1	JB 1-12 inclusive
	JB 20-23 "
	JB 25-28 "
	TOM 1-20 "
	MIKE 1-9 "
	MIKE 1 Fraction
	MIKE 2 Fraction
	BILL 1-11 inclusive
	AB 1-29 "



NORTH PACIFIC MINES LTD.
DANSEY PROPERTY

CLAIM MAP

MARCH 15-'67

DRAWING Nº. D 27

. . . . . P.ENG.
ALLEN GEOLOGICAL ENGINEERING LTD.

F 5-8 inclusive
F 9 Fraction
F 10 Fraction

Group 2 REZ 1-4 inclusive
REZ 5 Fraction
REZ 6

The claims are all staked in accordance with the requirements of the mineral act and are in good standing.

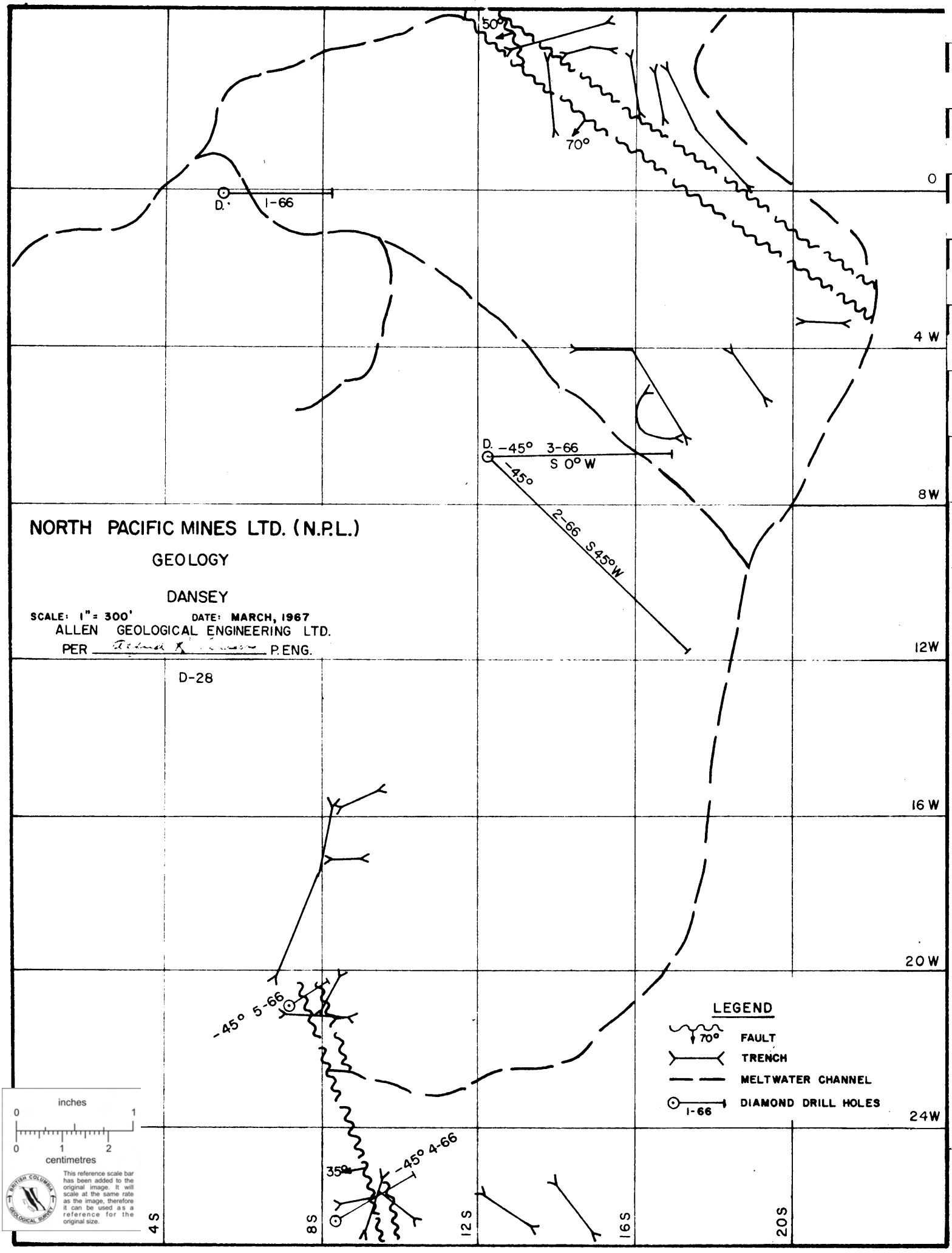
5. GEOLOGY

Field work has been confined to the REZ claims at the northwest end of the property and a one mile square area which includes the Dansey mineralized area on the southeast end of the holdings.

The REZ claims are underlain almost wholly by Tertiary volcanic rocks except for a small area at the southeast end of the property where quartz diorite is exposed.

The area of the Dansey showings is underlain by a complex assemblage of igneous rocks. Guichon quartz diorite has been intruded by Bethelehem quartz diorite, quartz diorite porphyry and andesitic rock. There is a clear cut north-south trend to a zone of hybrid rock which is believed to be the contact phase between the igneous rocks and the Nicola volcanic and sedimentary rocks. This rock is black, fine grained and compact.

There are two fault zones crossing the area. One strikes northeast and dips 70 degrees northwest and the other strikes northeast by east and dips 35 degrees northwest. Associated with



NORTH PACIFIC MINES LTD. (N.P.L.)

GEOLOGY

DANSEY

SCALE: 1" = 300' DATE: MARCH, 1967

ALLEN GEOLOGICAL ENGINEERING LTD.

PER _____ P.ENG.

LEGEND

- 70° FAULT
- TRENCH
- MELTWATER CHANNEL
- 1-66 DIAMOND DRILL HOLES

inches

0 1

centimetres

0 1 2

the major structures are numerous shear and fracture zones.

Mineralization exposed to date is associated closely with the shearing and fractured zones. Pyrite and chalcopyrite are commonly found within the zones and also rather finely disseminated throughout adjoining highly altered wall rock. Molybdenite is associated with fracture zones at two isolated locations. Bornite, magnetite and hematite have been noted on one or two shear zones. In and around the sheared and altered zones secondary minerals include malachite, azurite, chrysocolla and native copper.

Argillic alteration is prevalent within the sheared and altered mineralized zones. Fracture coatings of red iron oxcide, epidote and chlorite predominate in the weaker altered zones.

6. TRENCHING

Western Trenches

Trench #1 - A northeasterly trending shear is present near the eastern end of the trench. The rock is composed of fine to medium grained younger diorite containing locally disseminated chalcopyrite, malachite and red oxide.

Trench #8 - A shear is poorly exposed near the northern end of the trench. Its attitude was not obtainable.

Trench #9 - This is the westernmost trench on the property. Guichon granodiorite is exposed between 90 and 100 feet from the north end. A thin shear striking N30E and dipping vertically is present. A small amount of disseminated chalcopyrite and malachite occurs.

Trench #7 - The trench was water-filled during August, 1964 and no sample was taken. A shear is indicated but no mineralization is visible.

V-Trenches

Trenches 2, 3 and 4 - These three trenches expose major shearing and copper mineralization. The main shear is located at the southeastern end of Trench #3 and the eastern end of Trench #2. It is about 60 feet wide and contains abundant chalcopyrite, malachite and red oxides. The intrusive rock is badly altered and argillic. The main joint and shear trend is about N 30 - 50 degrees east, with a dip of 35 to 65 degrees northwest. The projected trend to the northeast is just north of Trench #6.

Movement along shears has not been determined but is apparently fairly slight (i.e. NW - NE, 100 feet laterally). The best exposures are in Trench #3. Over an interval of 100 feet north along the floor of the trench the shearing decreases significantly. Guichon was well as dark granodiorite are present, the darker material being most altered.

Dissemination of copper minerals is persistent throughout most of the interval. Mineralization is concentrated in the shears and often along tiny fractures within the more solid wall rock.

Eastern Trenches

Trench #6 - The southern edge of Trench #6 lies along

the most northeastern flank and at the head of a meltwater channel. As in Trenches 2, 3 and 4, the jointing and main shearing trend to the northeast. However, just to the north of the junction of Trenches #5 and #6 there is some cross shearing (North 11 degrees east). Nearly all of the rock is younger diorite. To the east no Guichon has been noted.

Trench #5 - It extends southeasterly from Trench #6. The western end is sheared but without mineralization.

Trench #10 - It contains one main shear which can be traced northeasterly to Trench #11. There is some malachite and chalcopyrite in the exposed rock.

Trench #11 - This is the easternmost trench and extends along the flank of a low hill. The southeastern 100 feet shows no shearing but contains chalcopyrite and minor bornite. The remainder of the trench contains shears with some copper mineralization.

Assays

The following are the assay results of twelve samples taken from the trenches:

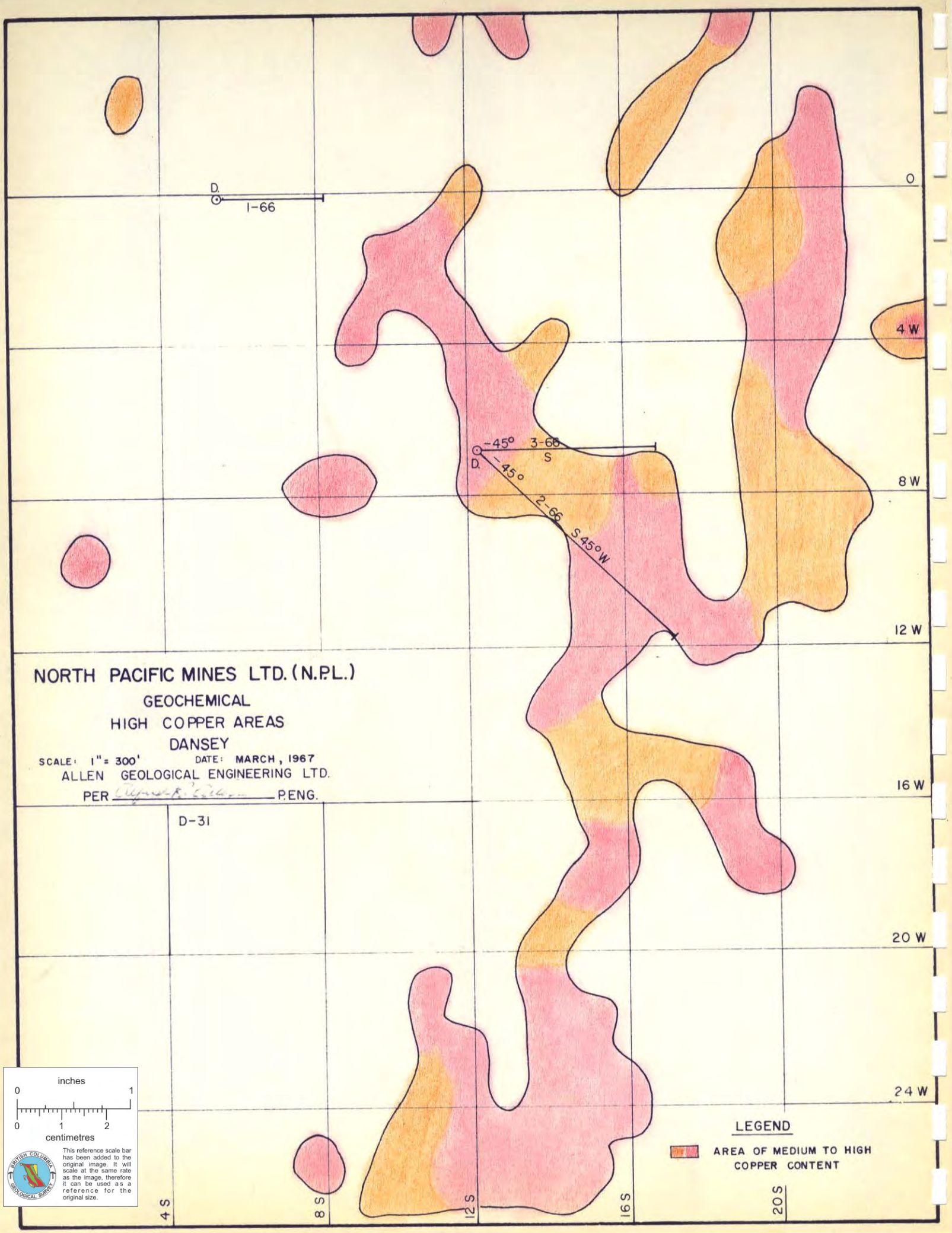
Sample No.	Cu. %	Description
3216	Trace	Trench #3 - 5 ft. interval in diorite
3227	0.22	Trench #3 - 5 ft. interval in shear
3228	0.10	Trench #2 - 5 ft. interval in altered diorite
3231	0.60	Trench #2 - 5 ft. interval in shear
3238	0.08	Trench #2 - 5 ft. interval in diorite
3241	0.05	Trench #2 - 5 ft. interval in diorite
3248	0.05	Trench # 6 - 15 ft. interval in diorite
3252	0.73	Trench # 6 - 15 ft. interval, shear & diorite
3256	0.04	Trench #6 - 5 ft. interval, crushed diorite
3259	0.08	Trench #5 - 10 ft. interval in diorite
3267	0.10	Trench #11 - 40 ft. interval in diorite
3268	0.02	Trench #11 - 50 ft. interval in diorite

Fifteen hundred feet east, a second series of trenches have been excavated to check anomalous areas outlined by geophysical surveys. Twelve large trenches expose strong weathered and fractured zones containing disseminated sulphide mineralization and mineralized sheared and fractured zones over an area 1,200 by 800 feet. Drawing D-28 shows the locations of the trenches.

7. DIAMOND DRILLING

The Dansey showings were checked by five diamond drill holes in 1966.

Drilling was done by Canadian Longyear Company on a contract basis. BQ wireline with swivel core barrel and stepped bits were used. Mud was used as required.



NORTH PACIFIC MINES LTD. (N.P.L.)

GEOCHEMICAL
HIGH COPPER AREAS
DANSEY

SCALE: 1" = 300' DATE: MARCH, 1967

ALLEN GEOLOGICAL ENGINEERING LTD.

PER _____ P.ENG.

D-31

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centimetres

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BRITISH COLUMBIA GEOLOGICAL SURVEY

The following holes were drilled.

Hole Number	Location S	Location W	Angle Degrees	Direction	Length Feet
1-66	600	0	-60	South	707
2-66	1,200	700	-45	S 45 W	829
3-66	1,200	700	-45	South	694
4-66	900	2,450	-45	S 15 E	310
5-66	780	2,330	-45	S 20 E	249

In all holes disseminated pyrite with irregular zones of finely disseminated chalcopyrite were encountered, but none was of commercial grade.

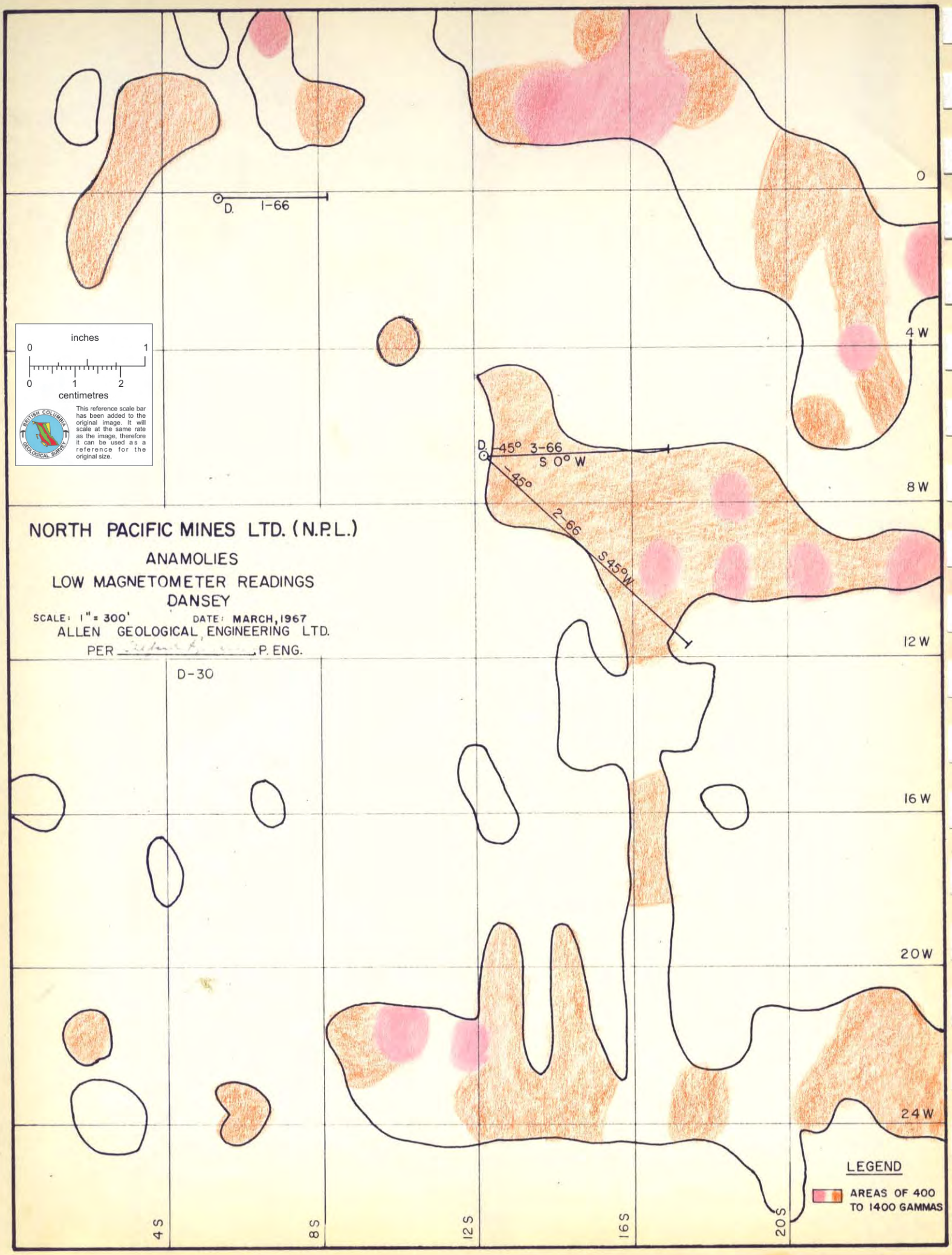
8. GEOCHEMICAL SURVEY

An area one mile square was surveyed by an east-west base line and north-south cross lines spaced 200 feet apart. Stations were picketed every 100 feet along all lines.

Samples of soil were taken from each station. Where possible the samples were taken below the layer of humus and plant remains.

The samples were tested in the field by the Rubianic acid method for copper.

The medium to strong copper bearing samples were all located in the general area of the old workings, but this was



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NORTH PACIFIC MINES LTD. (N.P.L.)

ANAMOLIES
LOW MAGNETOMETER READINGS
DANSEY

SCALE: 1" = 300' DATE: MARCH, 1967

ALLEN GEOLOGICAL ENGINEERING LTD.

PER _____, P. ENG.

extended as a result of the survey in excess of 1,500 feet to the east.

The map accompanying this report, Drawing number D-31 shows the areas of medium and high copper soil content.

9. MAGNETOMETER SURVEY

On the same grid used for the geochemical survey a magnetometer survey was conducted.

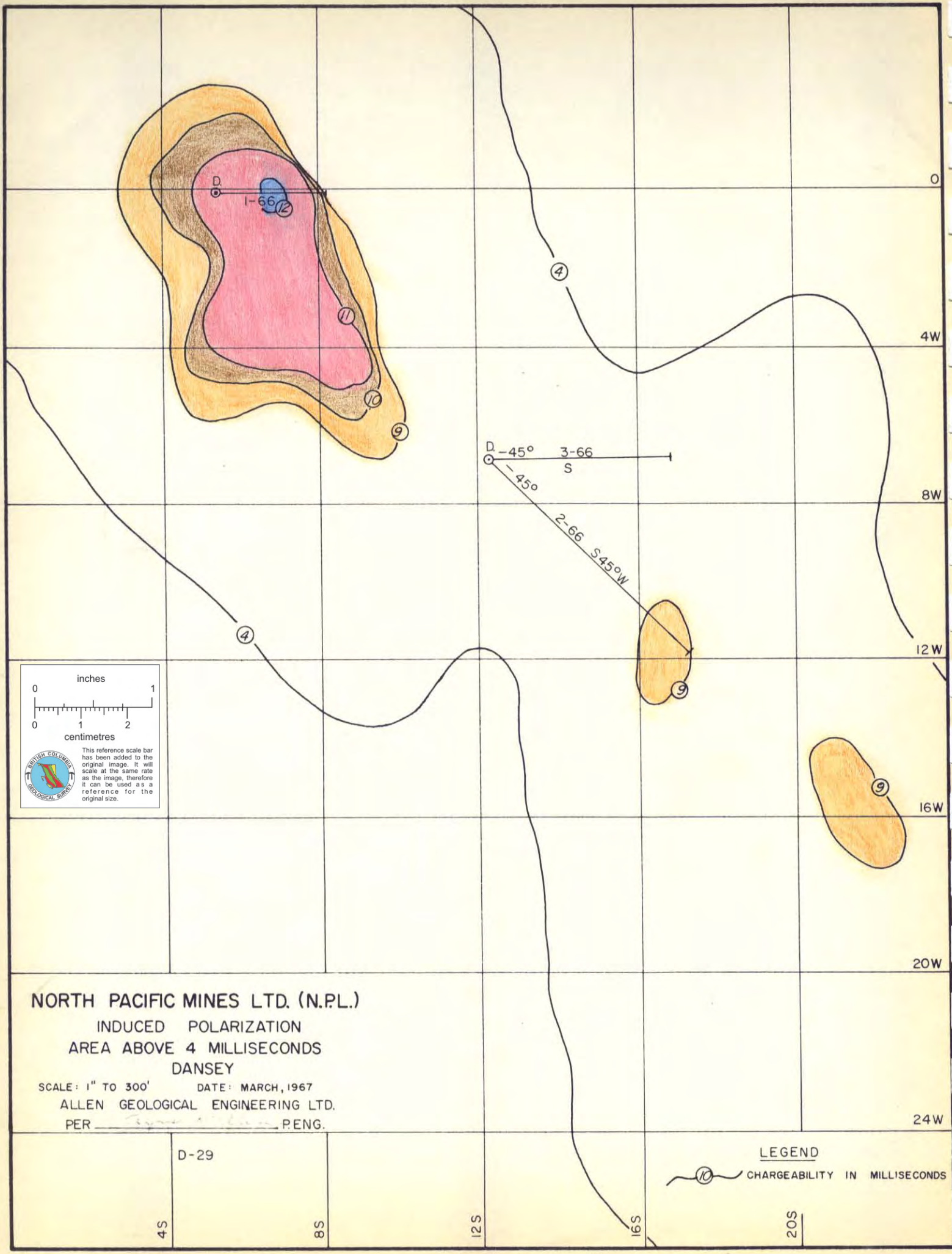
Areas of low magnetic intensity are considered anomalous. These corresponded remarkably well with the areas of high copper content in the soil.

The areas of low magnetic intensity are shown on the accompanying map, Drawing number D-30.

10. INDUCED POLARIZATION SURVEY

By contract with Lockwood Surveys Limited an induced polarization survey was conducted over the same grid pattern as the geochemical and magnetometer surveys. Dipole readings were taken at 200-foot intervals.

A wide band extends diagonally across the one mile square area from southwest to northeast, within which indicated chargeability is more than four milliseconds. Four smaller zones of higher intensity were outlined within this area along the central axis of same. The highest anomaly was an indicated chargeability of twelve milliseconds.



NORTH PACIFIC MINES LTD. (N.P.L.)

INDUCED POLARIZATION

AREA ABOVE 4 MILLISECONDS

DANSEY

SCALE: 1" TO 300' DATE: MARCH, 1967

ALLEN GEOLOGICAL ENGINEERING LTD.

PER _____ P.ENG.

Diamond drill holes 1-66, 2-66 and 3-66 were drilled on the basis of the two northeasterly anomalies.

The drill holes encountered fairly uniformly disseminated pyrite with scattered low chalcopyrite which did not warrant additional work.

Because of the strongly anomalous zones additional induced polarization surveying is warranted to the north, northeast and southwest of the area.

11. THE REZ CLAIMS

The REZ group of claims was examined in 1966 and a geochemical survey was conducted over the property.

The property was found to be covered with Tertiary volcanic rocks except for a small area near the southeast boundary.

No zones of importance were outlined.

12. SUMMARY AND CONCLUSIONS

On the Dansey property the main area of mineralization is on the JB claims. This is close to the contact between the Guichon batholith and the Nicola series. A northerly trending band of hard, black finely crystalline rock is believed to be a hybrid representing the contact zone. A short distance to the west this grades into a complex of Guichon quartz diorite, Bethlehem quartz diorite and porphyry dykes. One large andesite dyke has been observed.

Faults and associated zones of shearing are mineralized with pyrite and chalcopyrite. There are isolated zones near the shears which carry disseminated pyrite and chalcopyrite, and molybdenite.

It is concluded that the Dansey property is a good prospect and additional exploratory work is warranted.

13. RECOMMENDATIONS

It is herewith recommended that induced polarization surveys be conducted over the northeast and southwest extensions of the surveyed mile square area. Where warranted this should be followed by trenching and diamond drilling.

The extent of the programme will be dependent upon results obtained. No detailed estimates of expenditures may be made, therefore, but it is recommended that a fund of $50,000.00 be provided for additional work to the Dansey property.

III. THE CHETICAMP PROPERTY, CAPE BRETON ISLAND, NOVA SCOTIA

1. INTRODUCTION

The Cape Breton Island property was acquired by North Pacific Mines Limited in December 1965.

Electromagnetic surveys, both from the air and the ground, and a ground magnetometer survey, have been conducted over some or all of the property. The airborne survey was done in 1957, and the ground surveys in 1966.

This report is based upon information supplied by A.C.A. Howe and Associates Limited, who acted as consultants and supervised the geophysical surveys.

All data in this report has been acquired by A.C.A. Howe and Associates Limited, the writer has not examined the property.

2. LOCATION AND ACCESSIBILITY

The claims are located approximately seven miles due east of the village of Cheticamp, which lies on the western shore of Cape Breton Island, on Highway 19, (Cabot Trail). Cheticamp is approximately 105 miles from Sydney, and can be easily reached by good paved roads. The claims may be reached by four-wheel drive vehicle from Petit Etang by the newly constructed access road to the Barrington Exploration Corporation Ltd., Tract 104 property. The winter road from the Barrington Property has been

recently bulldozed through tracts 90 and 91 and repaired for use as a summer tractor road. The distance from Petit Etang to the center of the property is five miles. During good weather, the property can be reached, from Cheticamp, in one and one half hours.

3. TOPOGRAPHY

The property lies on the Cape Breton Highland Plateau at an elevation of approximately 1,300' AMSL.

The ground is undulating with alternating spruce and fir forest, rocky barrens and muskeg. Six small lakes and numerous ponds lie within the property. The drainage system from the southern part of the property is that of Faribault brook. The northern claims are drained by Dauphinee Brook and Le blanc Brook. All these streams are tributaries of the Cheticamp River, which follows a westerly course passing one and one half miles north of the property.

4. CLIMATE

The climate is amenable to year-round mining. When access roads and camp facilities are established, diamond drilling and other exploratory work can be carried on without interruption.

5. HISTORY

The first report of work on this area, aside from mapping by the Geological Survey of Canada, was reported by

Mineral Exploration Corporation which held the area south of the National Park under closure licence in the early 1950's. In 1953 an aeromagnetic survey was carried out by Canadian Aero Services of Ottawa for Minex. In 1957, Aero Physics of Canada carried out an airborne electromagnetic survey, again on behalf of Mineral Exploration Corporation. During the early part of the Mineral Exploration Corporation program the area being discussed was still included in the Cape Breton Highland National Park. In 1956, the park's boundary was changed and the ground under consideration became open for mineral investigation.

At this time geological crews mapped the outcroppings which were exposed in the streams of the area. During the Aero Physics survey three strong electromagnetic conductors were located in Tract 78.

There is no record that Minex carried out any further investigation of the area.

Personal communications with the staff of the Nova Scotia Department of Mines indicates that some follow-up work was done about 1960 by another company, but there is no record in the Mines Department files of the results of the work carried out at this later date. It has been verbally reported that the anomalies were caused by a sulphide body on the contact of an ultra-basic intrusive which is apparently located in the south-east quarter of Tract 78, approximately in the area of the anomalies outlined by the surveys recently carried out by A.C.A. Howe & Associates Limited, on behalf

of North Pacific Mines Limited.

Operations were apparently suspended before any definite information had been gathered.

The property was selected and staked on behalf of Mr. D.T. Winchell in September 1965, and acquired by North Pacific Mines Limited, in December 1965.

6. PROPERTY

The property consists of a total of 64 unpatented mineral claims of 40 acres each, more exactly described as follows.

TRACT	CLAIMS	REF. MAP	
78	All (16)	11K 10B	All in Inverness County, (Cape Breton Island), Nova Scotia.
90	All (16)	11K 10B	
91	All (16)	11K 10B	
102	All (16)	11K 10B	

A letter regarding titles from William J. Worrall, solicitor for North Pacific Mines, advised as follows, March 3, 1967:

> "Please be advised that as of this date we have requested A.C.A. Howe & Associates Ltd. in accordance with the recommendations received by our legal advisers in Nova Scotia, to make application at this time for Tract #78. The information which we have is that if such application is made and the current holder of Tract #78 does not fulfill

work requirements in accordance with the Act that the application would then be granted to North Pacific."

7. GEOLOGY

Approximately 75 % of the property is covered by overburden. The consolidated rocks of the area are considered to be Precambrian in age.

The area has been mapped in a preliminary manner only and is shown on the Geological Survey of Canada Preliminary Sheet No. 55-36. Information available indicates the geology to be more complex than shown on the G.S.C. preliminary map, with numerous areas of schist and volcanics included in the area shown as granite.

A basic intrusive is reported to occur in the south half of Tract 78. The west half of Tract 90 is underlain by Meta sediments and volcanics. A body of gabbro lies on the boundary of Tracts 90 and 91.

Tract 102 is shown to be underlain by granite. Some bands of schist and volcanics are expected.

Sulphide mineralization is known to occur in Tract 78 associated with the contact of the above mentioned basic intrusive.

Elsewhere in the general area, silver, lead and zinc mineralization is known about $1\frac{1}{2}$ miles to the north-west of the center of the property (Tract 104). Noranda Mines Ltd., has a silver-lead showing in Tract 105, on Faribault Brook.

Approximately five miles south, a partially explored deposit of copper-zinc is located at Rocky Brook in Tract 18.

8. GEOPHYSICAL SURVEYS

An electromagnetic survey, over 10,000 feet of line was done over the location of an anomaly indicated by an airborne electromagnetic survey made in 1957. A CRONE J.E.M. Unit was used, employing the "shoot back method". Coil spacing was 200 feet. Frequencies of 1,800 c.p.s. and 480 c.p.s. were used.

An anomaly, approximately 1,000 feet long, is open to the south. This coincided with the airborne electromagnetic and a magnetometer survey anomaly. The effect is believed caused by pyrrhotite with chalcopyrite and possibly some nickel values.

A magnetometer survey was conducted over the same area as the Electromagnetic Surveys, and 22,500 feet of line was completed.

The instrument used was a Sharpe MFI Fluxgate magnetometer. On all lines readings were taken every 100 feet except where anomalous conditions were encountered and there the spacing was reduced to 50 feet.

Diurnal checks were made hourly on base line stations.

An anomaly coinciding with the electromagnetic anomaly is 1,500 feet long and open to the south.

The geophysical survey results are shown on the maps submitted with this report, in a separate binder. These are Drawing Numbers C-36 and 11.K.10B.

9. SUMMARY AND CONCLUSIONS

The property held by North Pacific Mines in the Cheticamp area of Cape Breton Island, Nova Scotia, is located in an active mining region. Major companies hold adjoining properties and considerable work is in progress.

The local geology is known to be favorable for the occurrence of deposits of silver-lead-zinc mineralization.

Preliminary geophysical investigations have indicated the presence of mineralization on part of the property.

It is concluded that the property is located in a geologically favorable area and warrants extensive investigation.

10. RECOMMENDATIONS

In a report dated July 12, 1966, signed by A.C.A. Howe, P. Eng., of Toronto, the following recommendations were made.

A programme of detailed geophysical surveying, followed by diamond drilling, is recommended on the anomaly recently outlined in Tract 78. A total of approximately 2,000' of diamond drilling will be required to test the economic potential of this zone.

The costs of this program are estimated as follows:

Line cutting, 200' spacing 5 line miles at $70/line mile	$ 350.00
Detailed electromagnetic survey in the anomaly area, 5 line miles at $75/line mile	375.00
Detailed magnetic survey, same area, 5 line miles at $65/line mile	325.00
Diamond Drilling, 2,000' at $7.00/foot	14,000.00
Supervision	1,500.00
Contingency	450.00
Total	17.000.00

In addition, prospecting in the area of the other three anomalies is warranted. This prospecting should take the form of geophysical surveys, both Magnetic and Electromagnetic, covering the remainder of the property with special attention to the vicinity of the anomalies indicated by the 1957 Aero Physics of Canada Survey.

This work is estimated to cost as follows:

Line cutting 32 miles at $70/line mile	2,240.00
Electromagnetic survey (ground), 32 miles at $75/line mile	2,400.00
Magnetic detailing 20 miles at $65/line mile	1,300.00
Geochemical survey 32 claims	4,000.00
Gelogical reconnaissance	1,000.00
Supervision	1,500.00
Contingency	1,560.00
Total	14,000.00

It is recommended that the two phases of the program be carried out concurrently if possible.

The writer concurs with the above recommendations.

Respectfully submitted

per _____ P. Eng.

ALLEN GEOLOGICAL ENGINEERING LTD.

United Kingdom Building
409 Granville Street
March 20, 1967

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3. Nova Scotia Department of Mines, Reference Map 11-K-10-B

4. Geol. Surv. Canada, Preliminary Sheet 55-36