ASSESSMENT REPORT
GEOCHEMICAL REPORT
on the
VANGUARD GROUP

Skeena Mining Division
British Columbia

NTS 103 P/12E
Latitude 55 44'
Longitude 129 34'

Owner: Caulfield Resources
Operator: Noranda Exploration Company, Limited
(no personal liability)

By
G. Chinn and R. Baerg

October 21, 1989

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INTRODUCTION:

The Kitsault River valley, previously developed for its high-grade silver veining, has recently been the focus of renewed exploration for gold mineralization associated with a mineralized trend known as the Copper Belt. While copper is the most apparent mineral within this belt, precious metals associated with hydrothermal mineralization have been discovered in several localities.

The Vanguard Group is situated at the northwestern end of the Copper Belt and encompasses a large area of hydrothermally altered rocks hosting base and precious metal mineralization.

Detailed geological mapping, soil and rock sampling, and diamond drilling programs were instigated to test the economic potential of the known showings as well as to locate new exploration targets.

LOCATION AND ACCESS:

The Vanguard Group is located approximately 32 kilometres southeast of Stewart, British Columbia and is centred near 55 44' north latitude and 129 34' west longitude in the Skeena Mining Division (Figure 1). The claims straddle Homestake Ridge, a broad spur separating the West Kitsault and Kitsault Rivers just south of the Cambria Icefield. This ice field occupies much of the ground between the property and Stewart, the closest support centre.

Road access to within 8 kilometres of the property had been established by Dolly Varden Resources to access their property from Alice Arm, at the mouth of the Kitsault River. This road, currently passable for only 14 kilometres could be upgraded and extended to the property should road access be required. Overgrown trails from the end of this road presently provide access to the property by foot, although crossing the Kitsault River is likely to be difficult.

At the present time access to the property is best gained by helicopter from Stewart, the return trip taking approximately 40 minutes.

PHYSIOGRAPHY, VEGETATION AND CLIMATE:

The majority of the Vanguard Group occupies a sub alpine plateau which on a local scale consists of an abruptly undulating ridge and gullies, elevation differences in the order of 10's of metres. The ridges and gullies are generally observed to trend between due north and 020 N. Overburden is nil to thin on ridges and thicker, though undetermined, in the gullies. Ridges typically host well drained mineral soils whereas gullies host soils which are moist to saturated and commonly rich in organics. The eastern part of the property is characterized by a steep, easterly dipping, vegetated slope with steps and cliffs. Soils are typically very moist to saturated which probably reflects ground water seepage. This slope represents a total vertical drop of 125 metres.

The first recorded mineral exploration in the upper Kitsault River area took place in 1912 when the Dolly Varden mineral claim was staked on a quartz vein carrying gold, silver and copper values on the west side of the Kitsault river, south of Evindsen Creek. The next two years saw considerable exploration activity and several copper showings with gold and silver values were staked and worked north of the confluence of Evindsen Creek and the Kitsault River. In 1914, the Homestake mineral claim was located by A. Davidson of Alice Arm. This was the first recorded activity in the immediate area of the Vanguard Group.

The Vanguard Group, still in good standing, received extensive work including about 275 metres of underground work between the early 1900's and 1966. The property was originally explored for copper and by 1927 several open cuts and two adits had been completed.

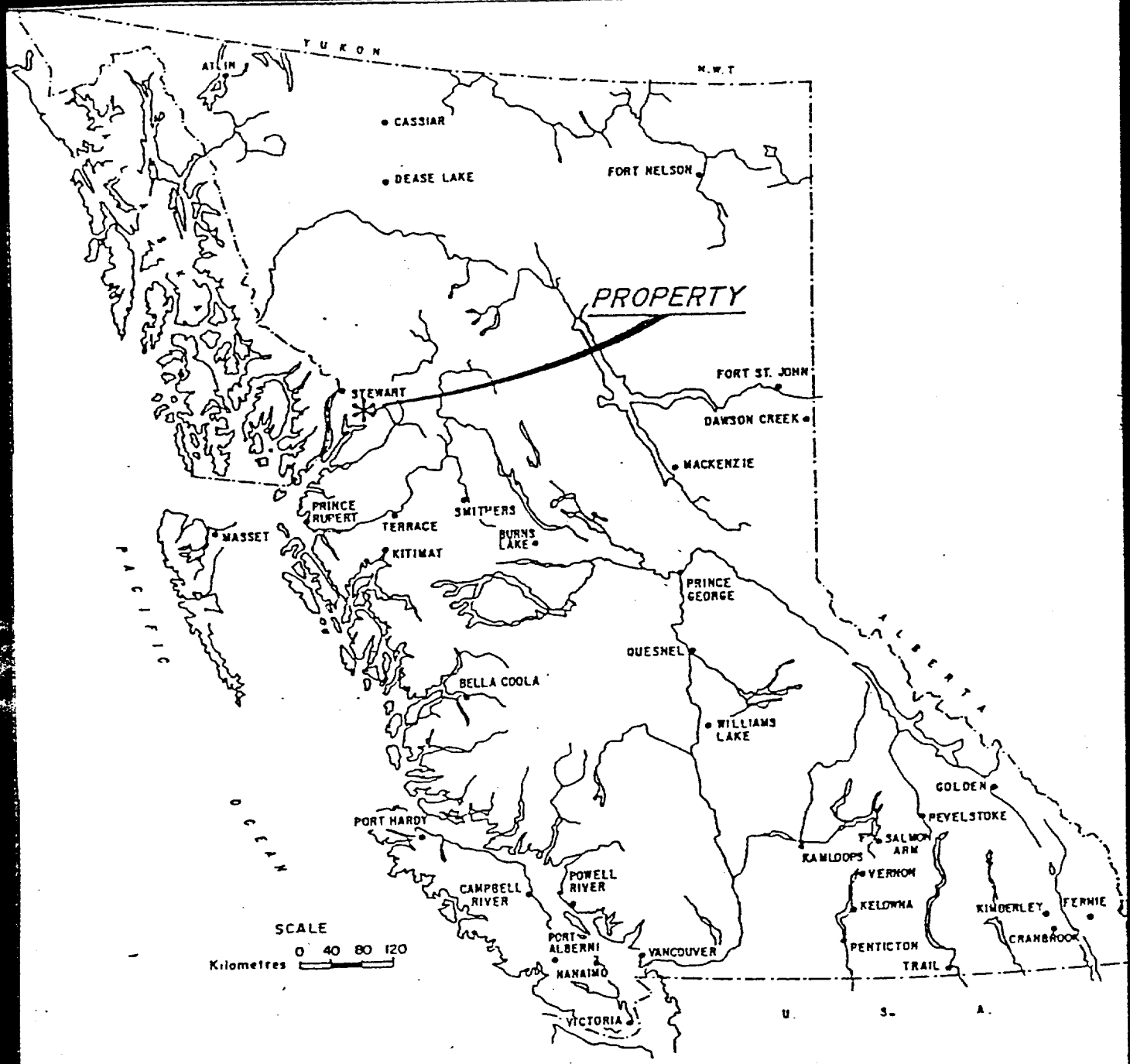
About 1925, gold was discovered on the Nero claim north of the main copper showing. In 1947 a crosscut was begun below the main gold showing and work continued on this until the early 1950's.

In 1966 Canex Aerial Exploration Ltd. optioned the property from the owner M. Peterson of Alice Arm. Canex later dropped the option . In 1968 an additional 3 metres was of underground work was completed. Caulfield Resources optioned the property in 1981 and conducted a widely spaced soil sampling program and magnetic survey. In 1989 the Vanguard group along with the adjacent Cambria and Homestake claims were optioned to Noranda Exploration Company Limited. Work performed by Noranda is the basis for this report.

REGIONAL GEOLOGY:

The upper Kitsault Valley area is underlain by a complex suite of marine sedimentary and volcanic rocks which lies on the extreme western margin of the Intermontain Belt, just east of the Coast Plutonic Complex (Figure 3). Both the lower sedimentary and volcanic units are correlative with the Lower to Middle Jurassic Hazelton Assemblage and are intimately related. These units are intercalated and may have been deposited during a geologically complex period. The base of the oldest member, a sequence of deep water, thinly bedded clastic rocks, is not exposed in the area, but is believed to be 1 200 metres thick. A sedimentary unit of probable Middle to Upper Jurassic age, referred to as the Bowser assemblage, overlies these rocks. This assemblage is exposed at both ends of the Kitsault Valley. Scattered Eocene intrusions such as those on Mt. McGuire and near Alice Arm represent the youngest rocks in the area.

The entire sequence has been locally hydrothermally altered and while generally easy to distinguish some of the rocks in the area have been silicified and/or sericitized to a point where the units can not be differentiated. Intense pyritization usually accompanies this alteration.



REVISED	VANGUARD GROUP
	LOCATION MAP
FROLIN	SURVEY BY: DATE: Oct/89
N.T.S.	DRAWN BY: G. Chinn SCALE: 1:8,000,00
DWG.No. 1	NORANDA EXPLORATION OFFICE: Prince George

In areas of good drainage the property is forested with ceder and alpine fir. Alder and willow are commonly present on steep damp slopes whereas meadows occupy the gullies.

Drainage is generally poor with numerous lakes and ponds bounded by bog growths. Lakes are typically elongated along the topographic fabric. Most drainage appears to be subsurface with running streams forming only on the steepest slopes.

Precipitation in the area is in access of 5 000 millimetres per year. The higher and less exposed portions of property appears to accumulate in excess of 5 metres of snow during the winter, much of which remains on the property well into July.

PROPERTY:

The Vanguard Group consists of seven two post claims, the Vanguard, Nero, Nimrod, Motherlode, Vanguard Extension, Dreamland and DeMilo. These claims are located on Figure 2 and Table I details all other pertinent information.

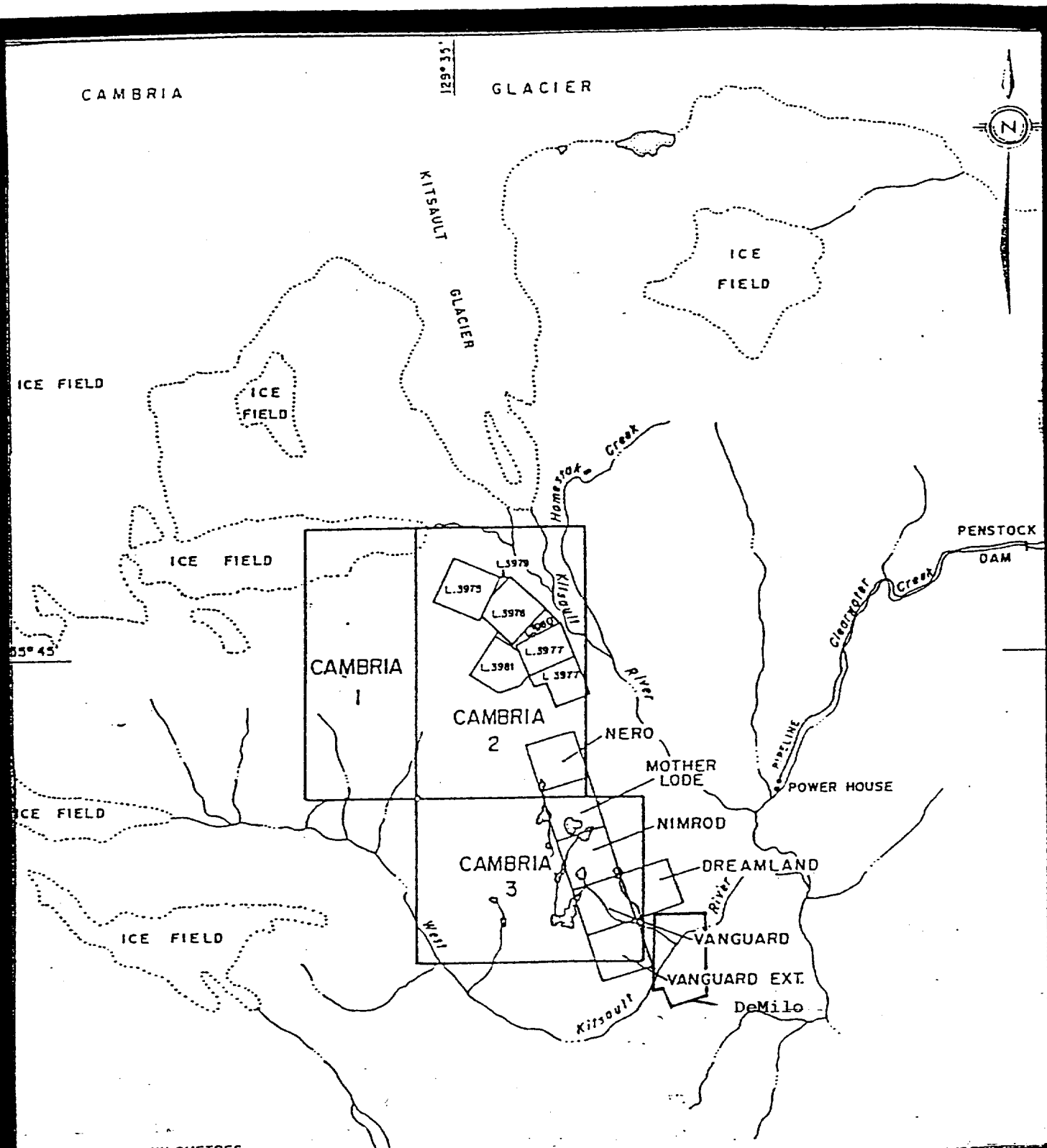
Table I. Claim information
Vanguard Group
Skeena Mining Division:

Claim Name	No. of Units	Record No.	Expiry Date
Vanguard	1	1003	Aug. 24/95
Nero	1	1004	Aug. 24/95
Nimrod	1	1005	Aug. 24/95
Motherlode	1	1007	Aug. 24/95
Vanguard Extension	1	1323	Sept. 4/95
Dreamland	1	2448	Oct. 10/95
DeMilo	2	128	July 30/95

HISTORY:

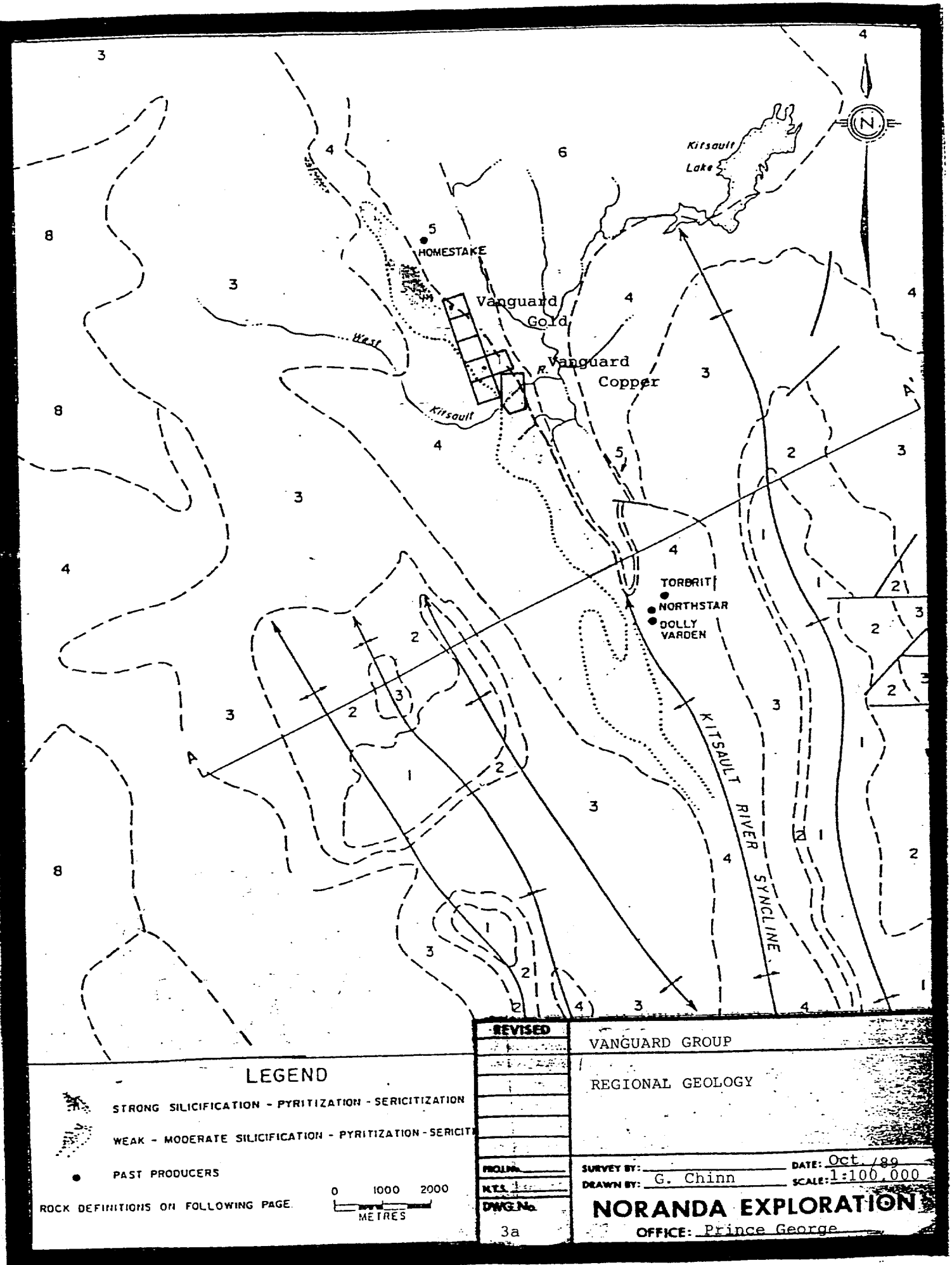
Mineral exploration on the Kitsault valley started in the early 1900's because of interest generated by the discoveries at Anyox and in the Stewart region. The Dolly Varden, Homestake, North Star and Torbit properties were mined between 1915 and 1959. Total production from the Dolly Varden, North Star and Torbit mines was 1 284 882 tonnes grading 485 gmt silver, 0.38% lead and 0.02% zinc (Dawson et al., 1986). In 1939 the Homestake mine shipped 8 tonnes of selected ore which returned 1120 grams gold, 1617 grams of silver, 63.5 kilograms lead, 303 kilograms of zinc and 599 kilograms of copper.

The area saw renewed interest when exploration focused on porphyry copper-molybdenum deposits from 1965 to 1970. The Ajax molybdenum prospect was staked during this period. Drilling at Ajax outlined indicated reserves of 526 967 000 tonnes grading 0.09% molybdenum (Dawson et al., 1986).



REVISED	VANGUARD GROUP
	CLAIM MAP
PROJ No. 245	SURVEY BY: G. Chinn DATE: Oct/89
N.T.S. 103P	DRAWN BY: G. Chinn SCALE: 1:50,000
DWG. No. 2	NORANDA EXPLORATION
	OFFICE: Prince George

NOTE: Crown grants as plotted on Federal 1:50,000 - location appro



LEGEND

STRONG SILICIFICATION - PYRITIZATION - SERICITIZATION

WEAK - MODERATE SILICIFICATION - PYRITIZATION - SERICITE

PAST PRODUCERS

ROCK DEFINITIONS ON FOLLOWING PAGE.

0 1000 2000
METRES

REVISED	
PROJ No.	
N.T.S.	1
DWG No.	3a

VANGUARD GROUP

REGIONAL GEOLOGY

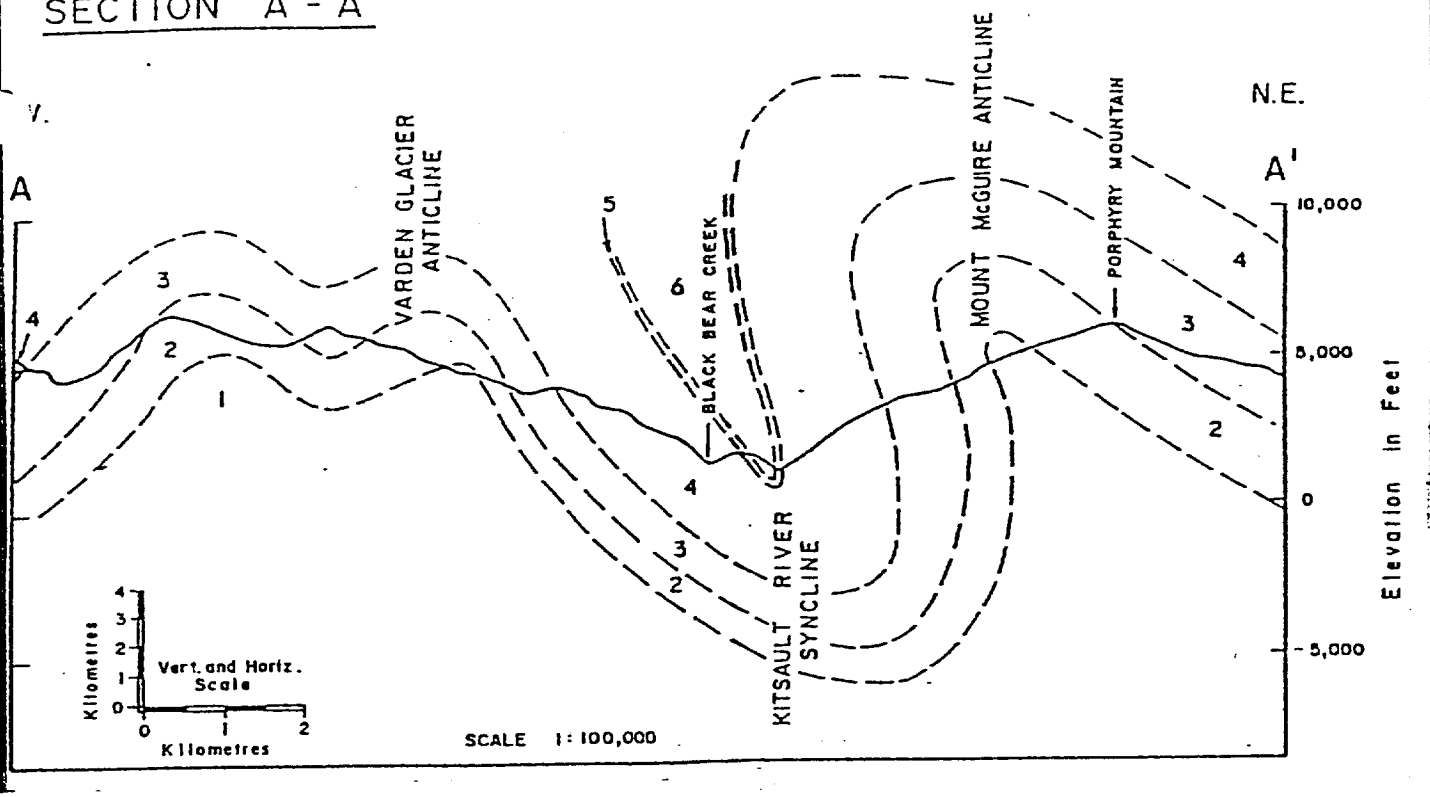
SURVEY BY: _____ DATE: Oct. /89

DRAWN BY: G. Chinn SCALE: 1:100,000

NORANDA EXPLORATION

OFFICE: Prince George

SECTION A - A'



After Alldrick et al, 1986

LEGEND

Tertiary

[8] COAST RANGE BATHOLITH: Quartz monzonite and granodirite.

Middle -Upper Jurassic

[6] UPPER SEDIMENTARY UNIT: Siltstone, shale, conglomerate, limestone and minor sandstone.

Lower-Middle Jurassic

[5] EPICLASTIC AND FELSIC VOLCANIC UNIT: Volcanic conglomerate, breccia, dacite pyroclastics and feldspar porphyry flows.

[4] INTERMEDIATE VOLCANIC UNIT: Andesite pyroclastics, siltstone, sandstone, conglomerate and chert.

[3] MIDDLE SEDIMENTARY UNIT: Siltstone, volcanic breccia, sandstone and conglomerate.

[2] MAFIC VOLCANIC UNIT: Olivine and augite porphyry basalt flows, basaltic conglomerate, siltstone, sandstone, wacke and limestone.

[1] LOWER SEDIMENTARY UNIT: Siltstone, argillite, shale, wacke, sandstone and limestone.

REVISED	VANGUARD GROUP
	REGIONAL GEOLOGY
FIGURE	SURVEY BY: DATE: Oct/89
NTS	DRAWN BY: SCALE: 1:100,000
DWG No. 3b	NORANDA EXPLORATION
	OFFICE: Prince George

The members of the Hazelton assemblage have been folded into several major structures, all of which parallel each other and the north-south regional trend. Broad secondary folding perpendicular to this trend is also evident. The Kitsault River syncline, which approximates the Kitsault valley, is the prominent feature in the district. Many of the regions mineral deposits occur along this syncline, including all past producers.

Evidence of structural faulting, both major and minor, can be seen in many of the prominent valleys. The dominant trend of these faults appears to be north-northeast, with near vertical dips. A second set of conjugate? faults appear to trend northwest. Many of these structures have been intruded by Tertiary microdiorite and lamprophyre dykes.

Mineralization in the Upper Kitsault Valley has been categorized into four main types: silver rich quartz-barite-jasper replacement deposits; quartz-carbonate veining; silicified zones containing chalcopyrite; and auriferous quartz-carbonate veining associated with hydrothermal systems. The first category includes the Torbit, Dolly Varden and North Star orebodies and is typified by a silver, galena and sphalerite assemblage. The quartz-carbonate vein deposits are stratabound and sparsely mineralized with pyrite and other minerals. The third type of mineralization occurs within the Copper Belt, and will be discussed under the property geology.

FIELD WORK:

Early in the field season a grid was established over the Vanguard Group which was centred on a baseline that extended from the old Vanguard cabin, on a bearing of 315 N, for 1 500 metres. Winglines are spaced at 100 metre intervals, extend 300 metres to the northeast and between 75 and 500 metres southwest. Total area encompassed within the grid is 940 000 m and the total length of grid lines is 10.4 km.

A total of 396 soil, 10 silt and 249 rock samples were collected over the summer. This reports files only the results of the soil sampling programs.

Soil samples were collected from the "B" horizon at 25 metre intervals along the grid lines with the use of a grub hoe. Samples were collected at depth between 15 and 25 cm. The soil was placed in Kraft "wet strength" paper bags, dried and then shipped to Noranda labs in Vancouver, B.C. for analysis (for analytical procedure see Appendix IV). The grid was sampled and geologically mapped, however, only the geochemistry has been filed for assessment credit.

PROPERTY GEOLOGY:

The Vanguard Group was geologically mapped at a 1:2 500 scale. Rock exposures occur as numerous isolated or weakly interconnected outcrops. An attempt was made to map all outcrops within the grid area so as to maximize the

geological information and reduce geological conjecture. Mapping reveals the presence of two regionally identifiable units, a sedimentary and an igneous package. The sediments, which are exposed along the northeast and southwest margins of the grid, are dominantly dark grey to black silty argillites with light grey, silty laminations. Occasional interbeds of dark grey greywacke were also observed. Bedding in the east generally trends 315 N and dips moderately to the west, with some small scale folds observed. In the southwest the sediments are altered to a light grey to off white colour and have a massive chert-like texture which commonly contains pyrite. Primary laminations maybe occasionally recognized on weathered surfaces. Between the sedimentary exposures lies a belt of altered igneous rocks, about 700 metres wide, consisting of both volcanic and intrusive units. Extensive alteration obscures primary textures making subdivision difficult.

The igneous rocks become progressively more altered towards the east with the development of spaced cleavage, penetrative foliation and locally schistosity. These features trend between 110 and 130 degrees and dip steeply to either the east or west. At 9950N-10760E the eastern contact between the igneous and sedimentary rocks is well exposed. The contact is oriented at 115/55W with adjacent foliation developed in sheared sediments having a vertical dip. This contact represents a major fault which extends the length of the property and separates altered rock to the west with unaltered to the east. This fault has been termed the Vanguard Fault. The western sedimentary-igneouscontact is a nonconformity as indicated by numerous dyke-like bodies of variable size within the sediments.

Detailed mapping has identified and outlined two units within the igneous rocks bases on alteration assemblages and primary textures, an altered andesitic fragmental and a post volcanic altered intrusive unit. These units are described below along with the criteria used to distinguished them.

Hornblende Feldspar Porphyry Intrusive:

Identified by a primary igneous porphyritic texture with phenocrysts of altered feldspar and hornblende clearly visible. Feldspar appears to be replaced by sericite whereas hornblende is replaced by chlorite. Matrix varies from white to green depending on the degree of alteration. Phenocrysts vary in size from fine to coarse grained and are generally densely packed indicative of an intrusive. This lithology is commonly altered to a silica-sericite-pyrite or silica-chlorite-pyrite alteration assemblage.

Andesite Feldspar Porphyry Fragmental:

Identified by a primary feldspar porphyritic texture where feldspar phenocrysts have been replaced by quartz and sericite. Absent are any indications of chloritic altered hornblende phenocrysts. Occasionally a fragmental texture may be discerned from weathered surfaces. This unit too is commonly altered to a silica-sericite-pyrite, silica-sericite-carbonate-pyrite or silica-chlorite-pyrite alteration assemblage and the matrix varies from white to green accordingly.

Both igneous units display a variety of alteration assemblages some of which totally obliterate primary textures. In such cases classification into the volcanic or intrusive units was bases on spacial relationships. Three types of secondary alteration are identified within the area, sericite, chlorite, and carbonate. Carbonate alteration is restricted to the volcanic unit whereas sericite and chlorite alteration can occur in either.

Sericite Alteration:

This alteration is characterized by the assemblage silica- sericite-pyrite with less than 10% chlorite. Relic feldspar phenocrysts and/or fragmental textures may still be observed. Most chlorite appears to have been altered to sericite. Pyrite occurs as fine disseminations or as fine aggregates along fractures, usually between 2 and 5%. If chlorite is present pyrite is usually directly associated with it. This assemblage may be massive, cleaved, brecciated or silicified. Colour ranges from off white to light green or greyish when silicified.

Chlorite Alteration:

Both sporadic and pervasive areas of chloritic alteration are distributed within the igneous rocks. This alteration is characterized by the assemblage silica-sericite-pyrite with greater than 10% chlorite. This assemblage has a medium to dark green colour and occasionally hosts a quartz stockwork which may host chalcopyrite mineralization. Chlorite appears to progressively replace sericite. Finely disseminated and fracture localized pyrite greater than 5% is characteristic of this alteration. Furthermore the chlorite altered rocks typically weather to a limonitic orange owning to their slightly elevated pyrite content.

Carbonate Alteration:

Carbonate alteration occurs with increasing frequency and intensity as the eastern sediment-igneous fault contact is approached. This alteration is characterized by the assemblage silica-sericite-carbonate-pyrite and typically has a grey to grey green colour. Typically this alteration is fine grained, massive and commonly silicified. Carbonate may be pervasive or restricted to thin veinlets and fracture fillings, rarely with chalcopyrite. This assemblage appears to evolve into a fine grained, foliated, cataclastic near the Vanguard Fault.

The Identified alteration assemblages are broadly zoned away from the Vanguard Fault indicating the importance of this structure to fluid flow. Nearest the fault carbonate alteration grades into sericite alteration which in turn grades into least altered rocks. Chlorite alteration generally occurs as narrow fracture localized zones, however three areas within the volcanic rocks host widespread alteration and possibly reflect significant structures.

Two known mineral showings are situated within the Vanguard Group, the Vanguard Copper and Gold showings (Figures 4-7).

The Vanguard Copper showing consists of a chloritic breccia with stringers and fracture fillings of pyrite, chalcopyrite and an adjacent quartz-carbonate vein with associated sericitic alteration. The host rock to the showing is an aerially restricted, fault controlled, chlorite altered volcanic in close proximity to the Vanguard Fault. Values of 0.079 oz gold, 4.2 oz silver and 1.3 % copper over 2.3 metres and 0.02 oz gold, 0.85 oz silver and 1.2% copper over 3.4 metres have been returned from two trenches. Best copper and gold values are well correlated with the pervasively chloritized and brecciated volcanics, whereas best silver values were obtained from the quartz-carbonate vein.

The Vanguard Gold showing consists of a calcite-ankerite vein with galena and chalcopyrite mineralization bounded by a quartz-sericite breccia and then in turn by chloritized volcanics. The vein in faulted and has a nonuniform thickness. The trend of the vein is 100 N and has a subvertical dip. Significant gold values are found within all units, however, silver values are restricted to the carbonate vein. Values of 0.18 oz gold, 0.31 silver and 0.31% copper over 6 metres have been returned over the showing.

GEOCHEMICAL RESULTS:

Soil Geochemistry:

Soil sampling was successful at outlining a number of geochemical features within the Vanguard Group (Figures 4, 5, 6, 7, 8). These features were tested by bedrock sampling for source and authenticity. In many cases a cause for the geochemical signature was ascertained.

Zinc anomalies occur down slope of the Vanguard Fault in areas underlain by black argillites. These anomalies may represent a high zinc background within the sediments or a hydromorphic dispersion from a buried up slope source.

A broad weak silver anomaly corresponds to the areal extent of carbonate altered bedrock and likely represents a hydrothermal enrichment during alteration. A strong silver anomaly parallels the western side of the Vanguard Fault and partially overlies the silver rich Vanguard Copper showing. This anomaly indicates a new potential for silver mineralization in the southeastern most part of the property.

Anomalous lead values in soils correlate well with the projected surface trace of the Vanguard Fault allowing further extension to the northwest.

Numerous spotty copper highs occur through out the property. These highs are aligned and may indicate the presence of previously undetected structures. Both known showings are characterized by copper anomalies and therefore other copper anomalies are attributed to hypogene mineralization. Many other

chalcopyrite occurrences, discovered during mapping, were not reflected in soils possibly indicating a rapidly decaying mechanical dispersion or complicated soil conditions.

Anomalous gold values are also generally spotty, which is typical of gold, however, two persistent anomalies were detected over the known showings and are therefore attributed to hypogene mineralization.

Bedrock and chip samples were successful at outlining a gold zonation within the mapped alteration assemblages. Carbonate alteration was generally found to be devoid of all but background values of gold. The large area of sericite alteration hosts a high background content indicating an order of magnitude enrichment. Chlorite alteration commonly hosts gold values enriched by 2 to 3 orders of magnitude over background levels.

Significant results for chip samples are presented in Appendix III.

DISCUSSION:

The low energy sediments identified within the Vanguard Group are characteristic of the Upper Bowser Assemblage of Grove (1971). The underlying maroon and green andesite fragmental and altered equivalent are indicative of the Middle to Upper Jurassic Hazelton Assemblage. Crosscutting relationships indicates a younger age for the intrusive. Intrusive activity was known to occur during the Tertiary and therefore the stock is thought to be of this age.

Deformation leading to the formation of the Vanguard Fault post dates the deposition of the Bowser sediments and likely was coeval with Tertiary intrusive activity. Hydrothermal fluids circulating in the proximity of the intrusions appear to have been channelled along faults and fractures, particularly the Vanguard Fault which generally appears to be enriched in lead and carbonate and locally in silver. Furthermore splays off the Vanguard Fault appear enriched in copper, gold and iron. Tensional and compressive structures may be a factor in the observed contrasting geochemistry.

CONCLUSIONS:

The geology of the Vanguard Group consists of members of both the Hazelton and Bowser assemblages which have been faulted, intruded and extensively altered by circulating hydrothermal fluids.

Results from soil geochemistry indicate that anomalous values of both gold and copper best represent hypogene mineralization. High zinc values are attributed to a high background levels in the argillites. A strong silver anomaly in the southeast part of the property is unexplained and may represent significant mineralization whereas a weaker silver anomaly appears to outline carbonatized volcanic. Lead anomalies appear to outline the surface trace of the Vanguard Fault.

Both known showings occur within extensively chloritized rocks which are in close proximity to the Vanguard Fault.

A favourable chemical environment for the precipitation of precious and base metals has been identified, however, a suitable mineralized structure has not yet been found. The Vanguard Fault does show some potential in this regard for silver mineralization in the southeast.

RECOMMENDATIONS:

The Vanguard Group has been shown to be within a geochemically favourable environment for gold and silver mineralization and as such further work is recommended. Further efforts should be made to identify, define and test other structures in the area, particularly those structures within the more brittle intrusive rocks. Determination of the stress axis should be carried out so as to identify likely tensional structures which would have a better probability of hosting economic mineralization. Furthermore the unexplained strong silver anomaly near the Vanguard Fault in the southeast should be followed up by surface trenching.

BIBLIOGRAPHY:

Dawson, G.L. and Alldrick, D.J.,1986, Geology and Mineral Deposits of the Kitsault Valley; Geological Fieldwork 1985, B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1986-1, pp. 219-224.

Grove, E.G., 1971, Geology and Mineral Deposits of the Stewart Area; British Columbia Department of Mines and Petroleum Resources, Bulletin No. 58.

BCMEMPA Assessment Reports No.: 956, 9400, and 16034.

APPENDIX I: STATEMENT OF COSTS
VANGUARD GROUP
GEOCHEMICAL REPORT - OCTOBER, 1989

A)	WAGES:	
	No. of days - 29 man days	
	Rate per day - $130/day	
	Dates from - July 11, 1989 - July 30, 1989	
	Total Cost:	$ 3,770.00
b)	FOOD & ACCOMMODATIONS:	
	No. of days - 29 man days	
	Rate per day - $50/day	
	Dates from - July 11, 1989 - July 30, 1989	
	Total Cost:	$ 1,450.00
c)	TRANSPORTATION:	
	No. of days - 29 man days	
	Rate per day - $100/day	
	Dates from - July 11, 1989 - July 30, 1989	
	Total Cost:	$ 2,900.00
d)	OTHER COSTS:	
	Soil Geochemistry	
	396 soils at 12.00/sample (Cu,Pb,Zn,Ag,Au)	$ 4,872.00
	Linecutting	
	10.4 km at $100/km	$ 1,040.00
e)	COST OF REPORT PREPARATION:	
	Author $300	
	Drafting $200	
	Typing $200	$ 700.00
	TOTAL COST:	$ 14,732.00

Appendix II

Statement of Qualifications

Relevant Training:

B.Sc. (1987) Saint Mary's University
Halifax, Nova Scotia
Geology

M.Sc. (1989) McGill University
Montreal, Quebec
Mineral Exploration

Relevant Experience:

1986 Geological Assistant
Prof. Georgia Piper
Saint Mary's University

1987 Geological Assistant
INCO Ltd.
Halifax, Nova Scotia

1988 Exploration Geologist
Noranda Exploration Co. Ltd
Prince George, British Columbia
Geological Assistant
Prof. Wallace Maclean
McGill University
Montreal, Quebec

1989 Exploration Geologist
Noranda Exploration Co. Ltd.
Prince George, British Columbia

Geoffrey Thomas Chinn

Geologist
October, 1989

ANALYTICAL METHOD

DESCRIPTIONS FOR GEOCHEMICAL ASSESSMENT REPORTS

The methods listed are presently applies to analyse geological materials by the Noranda Geochemical Laboratory at Vancouver. (March, 1984).

Preparation of Samples

Sediments and soils are dried at approximately 80°C and sieved with a 80 mesh nylon screen. The -80 mesh (0.18 mm) fraction is used for analysis.

Rock specimens are pulverized to -120 mesh (0.13 mm). Heavy mineral fractions (panned samples) are analysed in its entirety, when it is to be determined for gold without further sample preparation. See addendum.

Analysis of Samples

Decomposition of a 0.200 g sample is done with concentrated perchloric and nitric acid (3:1), digested for 5 hours at reflux temperature. Pulps of rock or core are weighed out at 0.2 g or less depending on the matrix of the rock, and twice as much acid is used for decomposition than that is used for silt or soil.

The concentrations of Ag, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, V and Zn (all from the group A elements of the fee schedule) can be determined directly from the digest (dissolution) with an atomic absorption spectrometer (AA). A Varian-Techtron Model AA-5 or Model AA-475 is used to measure elemental concentrations.

Elements Requiring Specific Decomposition Method

Antimony - Sb: 0.2 g sample is attached with 3.3 mL of 6% tartaric acid, 1.5 mL conc. hydrochloric acid and 0.5 mL of conc. nitric acid, then heated in a water bath for 3 hours at 95°C. Sb is determined directly from the acid solution with an AA-475 equipped with electrodeless discharge lamp (EDL).

Arsenic - As: 0.2 - 0.4 g sample is digested with 1.5 mL of 70% perchloric acid and 0.5 mL of conc. nitric acid. A Varian AA-475 equipped with an As-EDL measures the arsenic concentration of the digest.

Barium - Ba: 0.1 g sample is decomposed with conc. perchloric, nitric and hydrofluoric acid. Atomic absorption using a nitrous oxide-acetylene flame determines Ba from the aqueous solution.

Bismuth - Bi: 0.2 g - 0.3 g is digested with 2.0 mL of perchloric 70% and 1.0 mL of conc. nitric acid. Bismuth is determined directly from the digest into the flame of the AA instrument c/w EDL.

Gold - Au: 10.0 g sample (Pan-concentrates see below) is digested with aqua regia (1 part nitric and 3 parts hydrochloric acid). Gold is extracted with Methyl iso-Butyl ketone (MIBK) from the aqueous solution. Gold is determined from the MIBK solution with flame AA.

Magnesium - Mg: 0.05 g - 0.10 g sample is digested with 4 mL perchloric/nitric acid (3:1). An aliquot is taken to reduce the concentration to within the range of atomic absorption. The AA-475 with a nitrous oxide flame determines Mg from the aqueous solution.

Tungsten - W: 1.0 g sample sintered with a carbonate flux and thereafter leached with water. The leachate is treated with potassium thiocyanate. The yellow tungsten thiocyanate is extracted into tri-n-butyl phosphate. This permits colourimetric comparison with standards to measure tungsten concentration.

Uranium - U: An aliquot, taken from a perchloric-nitric (3:1) decomposition, usually from the multi-element digestion, is diluted with water and a phosphate buffer. This solution is exposed to laser light, and the luminescence of the uranyl ion is quantitatively measured on the UA-3 (Scintrex).

LOWEST VALUES REPORTED IN PPM

Ag - 0.2	Mn - 20	Zn - 1	Au - 0.1 (10 ppb)
Cd - 0.2	Mo - 1	Sb - 1	W - 2
Co - 1	Ni - 1	As - 1	U - 0.1
Cu - 1	Pb - 1	Ba - 10	
Fe - 100	V - 10	Bi - 1	

NORANDA VANCOUVER LABORATORY

PROPERTY/LOCATION: HOMESTAKE (RIDGE & VANGUARD)

CODE : 8909-029

Project No. :245 Sheet:1 of 2 Date rec'd:SEP. 5
Material :57 SOILS Geol.:G.R./R.B. Date compl:SEP.13
Remarks :

Values in PPM, except where noted.

T.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB Au
126	9350N-10675E	34	74	14	1.7	50
127	10700	22	50	10	1.2	45
128	10725	22	58	16	1.3	30
129	10750	24	160	10	1.2	25
130	10775	18	44	8	2.5	5
131	10800	24	78	24	1.9	30
132	9350N-10825E	48	68	34	2.9	60
133	9450N-10625E	22	80	4	1.6	5
134	10700	10	58	6	1.1	150
135	10725	32	158	16	1.9	20
136	10750	30	78	14	1.3	25
137	10775	22	58	52	1.1	25
138	10800	98	104	102	1.2	450
139	9450N-10825E	36	48	18	2.3	20
140	9500N-10750E	74	142	14	0.3	5
141	10775	86	74	44	6.9	2800
142	9500N-10800E	32	66	40	1.6	80
143	9550N-10675E	22	64	22	1.5	30
144	10700	262	186	56	2.0	455
145	10725	20	50	16	2.9	10
146	10750	40	60	12	1.0	10
147	10775	10	32	14	0.7	5
148	10800	40	114	96	1.1	5
149	9550N-10825E	52	164	16	1.2	25
150	CHECK NL-6	54	150	66	1.1	-
151	9650N-10675E	20	74	6	0.7	15
152	10700	20	62	16	1.2	5
153	10725	24	82	14	1.2	40
154	10750	36	120	22	1.5	45
155	9650N-10775E	40	300	170	3.4	75
156	9750N-10675E	18	56	12	1.4	5
157	10700	30	86	14	1.5	180
158	10725	36	102	92	1.6	240
159	9750N-10750E	66	104	22	1.5	130
160	9850N-10550E	12	40	8	1.1	20
161	10600	76	270	24	1.7	150
162	10625	22	58	6	1.3	60
163	10675	52	48	8	4.7	500
164	9850N-10700E	16	80	8	1.1	120
165	9950N-10500E	20	60	4	1.0	50
166	10525	16	42	8	1.5	100
167	10550	28	78	8	1.0	200
168	10575	20	58	12	1.5	40
169	10600	24	52	12	1.2	160
170	10625	20	64	8	1.1	55
171	10650	28	62	10	1.3	50
172	10675	50	56	8	1.2	145
173	9950N-10700E	170	84	420	3.1	1500

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T.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB Au	8909-029 Pg. 2 of 2
174	9950N-10725E	42	64	20	1.4	460	
175	10050N-10500E	130	52	12	2.3	25	
176	10525	14	24	16	1.4	50	
177	10550	40	94	10	1.2	105	
178	10575	76	108	68	4.0	3450	
179	10625	56	102	12	2.3	25	
180	10650	26	80	8	2.4	30	
181	10675	52	114	14	1.3	75	
182	10700	18	54	20	2.3	5	
183	10050N-10725E	20	58	4	0.9	5	

file

NORANDA VANCOUVER LABORATORY

PROPERTY/LOCATION:HOMESTAKE

CODE : 8908-021

Project No. :245
Material :734 SOILS &
Remarks :18 SILTS

Sheet:1 of 13
Geol.:R.B.

Date rec'd:AUG01
Date compl:AUG14

Values in PPM, except where noted.

T.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB Au
2	SILT 102751	46	330	16	0.2	10
3	102752	40	182	10	0.4	5
4	102753	20	690	10	0.2	5
5	102754	44	1200	22	0.7	10
6	102755	46	320	48	0.7	5
7	102756	32	224	20	0.4	5
8	102757	222	670	128	0.6	10
9	102758	32	232	24	0.4	5
10	102759	34	190	40	0.5	5
11	102760	102	520	58	1.6	30
12	102761	34	126	22	0.4	5
13	102762	94	108	76	1.4	25
14	102763	54	102	60	0.9	125
15	102764	82	340	32	1.1	200
16	102765	140	360	224	1.4	325
17	102766	36	120	32	0.9	225
18	102767	42	120	28	1.2	120
19	SILT 102768	40	120	28	1.1	200
20	8400N-10175E	16	48	6	0.2	5
21	10200	24	50	6	0.4	5
22	10225	26	50	20	2.0	10
23	10250	18	28	18	0.5	15
24	10275	24	42	16	0.6	545
25	10325	26	62	8	0.4	20
26	10350	40	56	16	1.1	35
27	10375	52	64	20	0.4	20
28	10425	36	60	10	0.5	5
29	10475	32	76	14	0.4	10
30	10500	16	40	12	0.3	60
31	10525	80	62	28	2.6	15
32	10550	54	76	68	1.4	25
33	10575	68	76	120	2.3	20
34	10600	52	70	62	2.0	40
35	10625	42	72	16	1.7	20
36	10650	90	102	120	2.0	55
37	10675	28	114	16	0.3	5
38	10700	172	98	48	2.6	10
39	10725	70	84	42	3.2	10
40	10750	40	102	34	1.3	5
41	10775	92	92	130	1.9	90
42	10800	42	86	24	0.5	75
43	8400N-10825E	40	152	20	0.6	5
44	8500N-10175E	38	48	6	0.8	10
45	10200	48	40	4	0.9	25
46	10225	24	46	12	2.0	15
47	10250	8	32	12	0.3	15
48	10275	20	34	4	0.5	120
49	8500N-10300E	22	36	22	0.7	5

T.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB Au
						8908-021 Pg. 2 of 13
50	8500N-10325E	12	56	42	1.3	25
51	10350	34	38	8	0.5	5
52	10375	78	56	6	1.9	50
53	10400	70	56	36	0.5	10
54	10425	62	64	14	0.5	5
55	10475	46	72	10	0.6	5
56	10500	36	52	10	1.3	5
57	10525	52	54	16	0.9	400
58	10550	28	58	8	1.4	40
59	10575	40	74	50	1.0	10
60	10600	210	42	14	11.7	5
61	10625	70	76	54	2.2	300
62	10650	60	94	38	1.5	100
63	10700	136	120	52	1.2	15
64	10725	36	80	38	1.7	5
65	10775	90	138	176	5.4	35
66	10800	136	186	360	3.8	75
67	10825	178	166	410	2.0	75
68	10850	40	106	24	1.5	20
69	10900	66	126	20	0.9	5
70	10925	50	140	94	1.6	5
71	10950	242	730	70	2.2	5
72	8500N-10975E	36	62	10	0.7	5
73	8600N-10175E	42	58	6	0.9	5
74	10200	24	48	6	0.3	5
75	10225	14	32	2	0.3	5
76	10250	30	38	4	0.4	10
77	10275	42	56	2	0.3	20
78	10300	28	36	6	0.4	40
79	10375	36	40	14	0.8	5
80	10400	56	46	14	0.5	110
81	10525	30	72	10	2.4	5
82	10550	24	40	24	2.1	5
83	10575	34	86	64	2.5	5
84	10600	28	54	46	1.8	55
85	10625	24	53	36	1.5	5
86	10650	36	68	82	2.0	245
87	10675	52	78	164	2.6	5
88	10700	106	108	92	3.5	20
89	10725	42	98	124	2.2	20
90	10750	66	102	152	5.2	5
91	8600N-10775E	178	116	214	5.1	5
92	8700N-10175E	114	208	14	0.8	15
93	10200	440	62	310	20.0	20
94	10225	32	48	8	0.9	30
95	10250	58	40	6	0.4	60
96	10275	22	36	4	0.7	125
97	10300	12	36	10	0.3	55
98	10325	50	74	20	0.6	50
99	10350	16	50	10	0.6	45
100	CHECK NL-6	50	144	60	1.0	-
101	10375	20	70	14	0.6	40
102	10400	24	54	12	0.8	15
103	10425	6	30	2	0.3	15
104	10450	10	38	12	0.3	20
105	10475	52	82	68	2.1	25
106	8700N-10500E	50	70	12	3.8	5

T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB 8908-021 Au Pg. 3 of 13
107	8700N-10525E	20	90	32	1.9	5
108	10550	24	62	18	0.7	5
109	10575	12	30	16	0.4	5
110	10600	36	88	14	0.7	10
111	10625	30	66	16	1.5	10
112	10650	30	56	18	1.2	10
113	10675	36	52	18	0.9	60
114	10700	32	62	40	2.0	5
115	10725	20	46	58	0.4	5
116	10750	24	48	50	2.9	5
117	10775	30	98	270	6.1	55
118	10800	64	144	400	6.0	10
119	10825	50	80	86	2.8	20
120	10850	184	70	54	5.0	225
121	10875	330	124	80	2.2	10
122	10900	196	146	144	17.2	120
123	10925	90	120	14	2.1	5
124	10950	54	94	42	1.0	5
125	8700N-10975E	40	116	102	15.0	70
126	8800N-10375E	26	30	16	0.7	390
127	10400	112	30	4	0.4	240
128	10425	18	30	6	0.1	60
129	10450	96	56	12	1.3	100
130	10475	44	74	16	0.8	55
131	10500	16	34	2	3.0	5
132	10525	12	34	16	0.2	5
133	10550	6	38	18	0.4	5
134	10575	48	42	6	1.0	30
135	10600	16	52	36	1.2	5
136	10625	18	62	44	2.6	5
137	10650	34	66	12	0.9	20
138	10675	82	40	14	2.4	15
139	10700	46	64	22	1.1	420
140	10725	24	68	68	17.4	15
141	10750	14	30	14	0.9	5
142	10775	30	56	88	6.5	190
143	10800	114	86	370	5.0	70
144	10825	8	60	22	1.7	5
145	10850	20	52	52	2.4	210
146	10875	102	270	248	3.1	125
147	10900	44	124	86	6.0	35
148	10925	30	220	102	10.5	55
149	10950	48	730	350	12.9	275
2	8800N-10975E	60	380	320	11.2	200
3	8900N-10375E	20	42	10	1.8	50
4	10400	30	38	10	0.4	35
5	10425	18	30	6	0.4	35
6	10450	22	40	6	0.5	35
7	10475	22	40	6	0.5	85
8	10500	24	32	4	0.2	30
9	10525	34	44	14	0.4	20
10	10550	24	56	20	0.9	15
11	10575	16	42	8	0.2	5
12	10600	38	72	36	2.6	40
13	10625	22	56	40	1.1	25
14	10650	26	40	12	1.5	50
15	8900N-10700E	26	76	88	1.0	15

T.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB 8908-021 Au Pg. 4 of 13
16	8900N-10725E	22	68	16	1.2	5
17	10750	12	58	64	0.8	5
18	10775	14	66	42	2.2	5
19	10800	28	98	196	11.0	5
20	10825	24	88	42	6.0	5
21	10850	24	56	122	3.0	180
22	10900	30	132	220	0.4	5
23	10925	24	170	114	0.6	5
24	10950	16	176	6	0.8	5
25	8900N-10975E	24	154	8	0.7	5
26	9000N-10375E	32	64	10	0.7	10
27	10400	22	68	8	0.4	370
28	10425	12	38	8	0.2	105
29	10450	14	42	4	0.2	25
30	10600	24	78	12	0.1	5
31	10675	30	66	24	0.7	5
32	10700	26	56	16	1.2	60
33	10725	30	88	96	9.3	40
34	10750	74	114	190	1.6	75
35	10775	34	114	96	5.3	5
36	10800	22	104	82	3.5	5
37	10825	26	56	34	0.8	5
38	10850	24	52	32	0.7	5
39	10875	12	62	10	0.7	5
40	10900	38	82	50	0.6	20
41	10925	36	82	48	3.4	10
42	10950	20	168	12	0.2	5
43	9000N-10975E	24	80	6	0.3	5
44	9100N-10375E	20	70	8	0.4	10
45	10400	14	30	6	0.3	35
46	10425	20	46	4	0.2	35
47	10450	24	70	8	0.1	5
48	10475	24	80	10	0.4	10
49	10500	24	70	14	0.2	25
50	10525	18	38	10	2.9	25
51	10550	8	60	8	0.2	10
52	10575	18	52	12	0.2	50
53	10600	14	36	4	0.2	35
54	10625	8	36	16	0.5	40
55	10650	18	42	12	0.5	25
56	10675	26	52	8	0.6	25
57	10700	22	66	12	0.6	20
58	10725	32	108	72	4.4	10
59	10750	20	96	34	0.7	10
60	10775	18	44	36	1.1	10
61	10825	20	58	10	0.6	5
62	10850	14	52	22	1.0	5
63	10875	16	48	12	0.6	5
64	10900	12	32	28	1.5	10
65	10950	20	28	12	0.4	5
66	9100N-10975E	24	60	8	0.3	5
67	9200N-10375E	10	44	6	0.4	100
68	10400	24	66	6	0.8	170
69	10425	20	70	6	1.0	60
70	10600	18	68	8	0.5	5
71	10625	30	78	14	0.6	90
72	9200N-10650E	26	74	8	1.8	30

.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB Au
73	9200N-10675E	24	56	18	0.6	80
74	10700	30	58	26	1.6	10
75	10725	16	34	8	0.6	20
76	10750	18	64	10	1.1	5
77	10775	48	120	56	1.7	40
78	10800	50	56	26	14.0	70
79	10825	46	58	26	1.5	75
80	10850	12	58	18	1.3	5
81	10875	16	130	94	0.3	5
82	10900	20	142	16	0.4	10
83	10925	16	68	8	0.4	5
84	10950	26	94	6	0.3	5
85	9200N-10975E	24	76	6	0.3	5
86	9300N-10375E	82	72	8	1.4	5
87	10400	46	42	6	1.6	130
88	10425	34	62	12	0.8	55
89	10450	16	72	8	1.0	5
90	10475	24	42	2	0.4	20
91	10500	42	74	4	0.5	10
92	10525	24	58	38	1.5	40
93	10550	32	62	14	1.0	20
94	10575	26	94	8	7.0	10
95	10600	22	152	14	4.2	85
96	10625	26	84	34	1.3	45
97	10650	18	50	12	0.7	35
98	10675	24	54	30	0.9	10
99	10700	28	44	8	0.3	5
100	CHECK NL-6	56	132	62	1.0	-
101	10725	34	70	14	0.2	50
102	10750	24	62	34	1.4	10
103	10775	34	66	16	6.0	55
104	10800	76	80	16	1.9	25
105	10825	64	110	14	0.8	40
106	10850	42	90	8	1.2	25
107	10875	510	212	62	6.4	150
108	10925	34	88	38	0.5	5
109	10950	22	80	8	0.1	5
110	9300N-10975E	20	64	6	0.1	5
111	9400N-10450E	20	78	10	0.3	5
112	10475	14	66	10	1.2	20
113	10500	12	70	8	0.4	5
114	10525	32	52	6	0.7	30
115	10550	48	50	6	1.1	20
116	10575	26	68	8	0.4	60
117	10600	32	60	8	0.5	80
118	10625	24	82	8	1.1	100
119	10650	14	26	2	1.4	15
120	10675	16	50	10	1.4	40
121	10700	28	56	16	6.4	30
122	10725	12	44	30	0.2	55
123	10750	20	76	22	1.4	40
124	10775	18	42	20	0.4	40
125	10800	580	80	52	1.5	700
126	10825	22	54	12	1.0	10
127	10850	34	144	200	1.2	150
128	10875	18	62	14	0.3	10
129	9400N-10900E	20	114	38	1.8	5

T.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	PPB Au
						8908-021 Pg. 6 of 13
130	9400N-10925E	34	180	32	5.4	5
131	10950	22	110	16	1.8	5
132	10975	26	52	4	0.6	5
133	9400N-11000E	56	200	24	1.4	20
134	9500N-10375E	18	52	4	0.6	5
135	10400	20	54	6	0.6	5
136	10450	20	60	6	0.7	5
137	10525	24	38	14	1.0	10
138	10550	22	46	6	0.4	180
139	10575	8	38	8	0.8	160
140	10600	10	38	6	0.3	100
141	10625	8	48	10	0.6	290
142	10650	130	134	12	6.1	105
143	10675	44	110	22	5.4	45
144	10700	44	88	32	4.0	20
145	10725	64	110	12	0.5	5
146	10750	52	58	24	4.2	4500
147	10775	120	96	78	10.4	3650
148	10800	34	258	244	4.8	5
149	10825	28	68	24	1.0	50
2	10850	26	72	36	1.0	90
3	10875	32	110	72	4.4	15
4	10925	26	222	10	0.5	10
5	9500N-10950E	20	50	8	0.9	5
6	9600N-9850E	58	80	6	0.5	5
7	9875	50	290	6	0.6	5
8	9925	30	82	10	0.9	15
9	9950	28	118	6	0.5	5
10	9975	26	76	14	0.4	10
11	10000	30	136	64	0.3	5
12	10025	98	202	26	4.0	30
13	10050	30	84	30	0.8	15
14	10100	10	38	6	0.3	5
15	10125	96	62	4	1.2	5
16	10150	18	44	10	0.5	5
17	10175	62	46	6	1.0	5
18	10200	110	36	2	1.2	5
19	10225	270	50	6	1.4	25
20	10275	20	64	6	0.5	5
21	10300	16	44	2	0.5	5
22	10325	32	66	6	0.4	5
23	10350	30	74	6	2.6	5
24	10375	12	36	8	0.6	5
25	10400	30	66	8	0.3	5
26	10425	36	108	10	0.7	5
27	10450	18	50	8	0.7	20
28	10475	18	78	10	0.3	5
29	10500	18	66	6	0.4	5
30	10525	8	38	6	0.2	5
31	10550	26	100	26	0.8	5
32	10575	24	82	8	0.3	5
33	10625	24	66	8	0.4	5
34	10650	22	78	20	0.8	5
35	10675	22	66	10	0.9	5
36	10700	26	82	8	0.6	10
37	10725	24	54	38	0.9	55
38	9600N-10750E	12	130	6	0.3	5

T.T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	Au
39	9600N-10775E	28	82	50	2.0	50
40	10800	24	132	10	0.5	5
41	10825	24	68	6	0.4	5
42	10850	12	56	18	0.2	5
43	10875	22	66	6	0.5	5
44	10900	30	90	8	0.9	5
45	10925	58	340	12	0.4	5
46	10950	26	82	16	0.4	5
47	9600N-10975E	18	60	20	1.7	5
48	9700N-9850E	26	54	8	0.8	5
49	9875	104	96	16	1.1	5
50	9900	62	126	12	0.6	5
51	9925	14	36	12	0.5	5
52	9950	10	32	2	0.2	5
53	9975	8	26	4	1.3	5
54	10000	116	1700	440	3.2	5
55	10025	106	204	56	5.0	25
56	10050	60	116	10	3.3	5
57	10075	122	244	66	1.1	10
58	10100	22	36	6	0.9	5
59	10125	36	60	10	0.4	45
60	10150	32	22	8	0.1	10
61	10175	22	62	4	0.9	10
62	10200	196	66	6	1.2	50
63	10225	40	44	12	1.8	5
64	10250	48	42	8	1.0	20
65	10275	160	60	10	2.5	15
66	10300	90	76	8	2.2	20
67	10325	340	114	18	1.8	15
68	10350	16	82	4	0.6	10
69	10375	18	84	20	2.5	5
70	10400	24	52	8	1.0	20
71	10425	32	80	18	0.6	45
72	10450	28	112	12	0.8	40
73	10475	28	36	4	0.7	10
74	10500	22	72	22	1.8	10
75	10525	18	60	10	2.1	15
76	10550	14	64	6	0.8	10
77	10575	14	52	4	0.7	15
78	10600	16	70	10	0.7	175
79	10625	32	146	8	0.9	30
80	10650	166	176	44	1.7	85
81	10675	24	76	10	0.6	10
82	10700	24	62	10	0.4	20
83	10700	28	86	50	1.1	275
84	10725	24	68	10	0.6	20
85	10750	22	98	8	0.3	5
86	10775	24	124	6	1.1	5
87	10800	20	246	6	0.6	5
88	10825	24	194	6	0.7	5
89	10850	20	74	6	0.1	5
90	10875	18	60	8	0.1	5
91	10900	22	80	18	0.5	10
92	10925	18	54	6	0.5	5
93	10950	18	68	8	0.1	5
94	9700N-10975E	20	72	16	0.5	5
95	9800N-9850E	14	136	50	0.9	5

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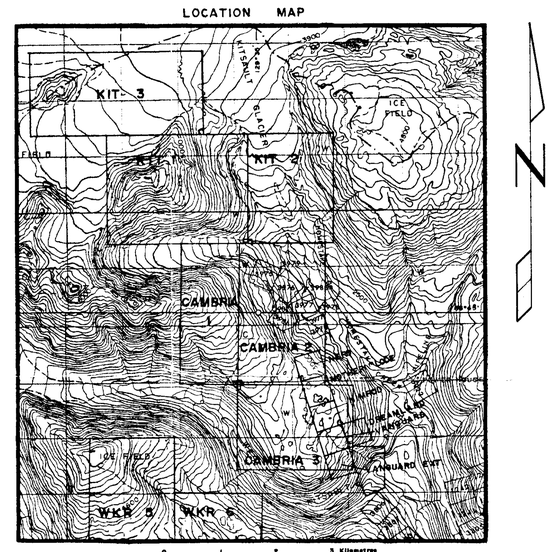
T. No.	SAMPLE No.	Cu	Zn	Pb	Ag	Au	Pg. 8 of 13
96	9800N-9875E	14	144	40	1.7	5	
97	9900	20	94	12	0.6	5	
98	9925	26	60	26	0.9	5	
99	9950	24	80	18	0.9	5	
00	CHECK NL-6	54	136	62	1.0	-	
101	9975	52	600	14	0.9	5	
102	10000	64	870	8	0.4	5	
103	10025	34	196	10	0.7	10	
104	10050	40	82	10	1.2	10	
105	10075	32	70	10	0.5	5	
106	10100	14	42	10	0.2	10	
107	10125	24	42	8	1.2	10	
108	10150	12	34	10	0.5	50	
109	10175	18	40	8	0.5	15	
110	10200	20	42	10	0.8	15	
111	10225	30	54	8	1.8	10	
112	10250	18	34	6	1.0	5	
113	10275	22	54	6	1.2	5	
114	10300	420	74	8	1.9	10	
115	10325	20	50	6	0.4	10	
116	10350	22	62	10	1.2	20	
117	10375	34	100	10	0.7	120	
118	10400	16	56	14	1.6	5	
119	10450	14	66	8	0.7	25	
120	10475	14	48	4	0.1	5	
121	10500	12	40	8	0.7	65	
122	10525	22	56	16	0.8	100	
123	10550	8	46	8	0.3	5	
124	10575	16	48	12	0.1	5	
125	10600	12	50	8	0.7	5	
126	10625	8	36	6	0.1	5	
127	10650	14	114	12	0.4	20	
128	10675	58	118	16	0.7	50	
129	10700	50	82	12	0.4	100	
130	10725	106	1800	190	2.7	675	
131	10750	22	74	10	0.7	5	
132	10775	18	92	12	1.3	5	
133	10800	42	490	20	1.3	5	
134	10825	14	72	6	0.9	5	
135	10850	14	76	8	0.6	5	
136	10900	18	78	10	0.2	5	
137	10925	12	76	10	0.4	5	
138	9800N-10975E	26	96	8	0.2	5	
139	9900N-9850E	24	54	6	0.5	5	
140	9875	44	100	12	1.6	5	
141	9900	42	104	32	1.1	5	
142	9925	310	460	168	1.3	70	
143	9950	32	152	350	4.1	5	
144	9975	72	380	22	0.8	5	
145	10000	18	48	6	0.4	5	
146	10025	22	74	34	2.1	5	
147	10050	22	44	10	0.1	5	
148	10075	26	80	8	0.7	5	
149	10100	50	124	24	1.9	5	
2	10125	34	56	12	0.6	5	
3	10150	54	90	10	0.7	5	
4	9900N-10175E	30	86	6	0.2	5	

T. T. No.	SAMPLE No.	Cu	Zn	Pb	Ag		PPB Au
5	9900N-10200E	84	50	6	0.3		5
6	10225	12	48	10	0.5		10
7	10250	16	48	12	0.6		10
8	10275	40	54	4	0.6		15
9	10300	208	56	10	0.3		20
10	10325	50	44	2	0.4		140
11	10350	10	30	8	0.4		200
12	10375	16	70	6	0.2		65
13	10400	26	82	14	0.3		105
14	10425	16	46	2	0.5		35
15	10450	16	50	8	0.1		15
16	10475	18	54	10	0.1		5
17	10500	4	32	10	0.3		45
18	10525	22	72	14	4.0		20
19	10550	16	44	6	0.8		60
20	10600	228	202	150	3.8		2150
21	10625	44	74	12	0.3		5
22	10650	16	56	10	0.3		530
23	10675	48	50	22	0.5		10
24	10700	4	46	6	0.6		90
25	10725	110	164	76	1.6		5
26	10750	52	168	60	2.1		10
27	10775	40	134	32	0.1		5
28	10800	38	116	28	0.3		5
29	10825	38	104	12	0.5		5
30	10850	22	92	10	0.1		5
31	10875	44	380	14	0.6		5
32	10900	16	330	10	0.2		5
33	10925	20	114	10	0.4		5
34	10950	10	68	12	1.4		5
35	10975	52	104	12	0.3		5
36	9900N-11000E	18	78	16	0.1		5
37	10000N-9850E	132	78	720	5.9		200
38	9875	26	94	42	2.3		5
39	9925	32	80	10	0.3		5
40	9950	30	140	22	0.2		5
41	9975	40	300	62	0.7	As	5
42	10000	520	1500	5000	160.0	18000	160
43	10025	30	78	18	0.6		5
44	10050	22	62	14	0.8		5
45	10075	50	82	38	4.8		5
46	10100	24	60	12	0.5		5
47	10125	16	48	6	0.2		5
48	10150	28	56	12	0.1		5
49	10175	22	46	10	0.4		5
50	10200	18	42	12	0.3		5
51	10225	22	66	26	0.4		5
52	10250	26	34	6	0.7		45
53	10275	22	42	10	1.0		40
54	10300	44	30	6	0.7		125
55	10325	100	62	18	0.9		5
56	10350	76	56	14	0.3		65
57	10375	130	78	32	0.3		60
58	10400	126	66	14	0.7		75
59	10425	22	38	6	0.4		20
60	10450	24	58	6	0.4		60
61	10000N-10475E	18	66	10	0.4		40

LOCATION MAP



Contour Intervals : 50, 200, 500 ppb

HOMESTAKE

SOIL GEOCHEMICAL SURVEY

PPB Au

PROJECT: HOMESTAKE PROJECT # : 245

BASELINE AZIMUTH : 315 Deg.

SCALE = 1: 5000 DATE : 8/ 1/89

SURVEY BY : R BAERG NTS : 103P12

FILE: C245HOM

NORANDA EXPLORATION

FIG. 4

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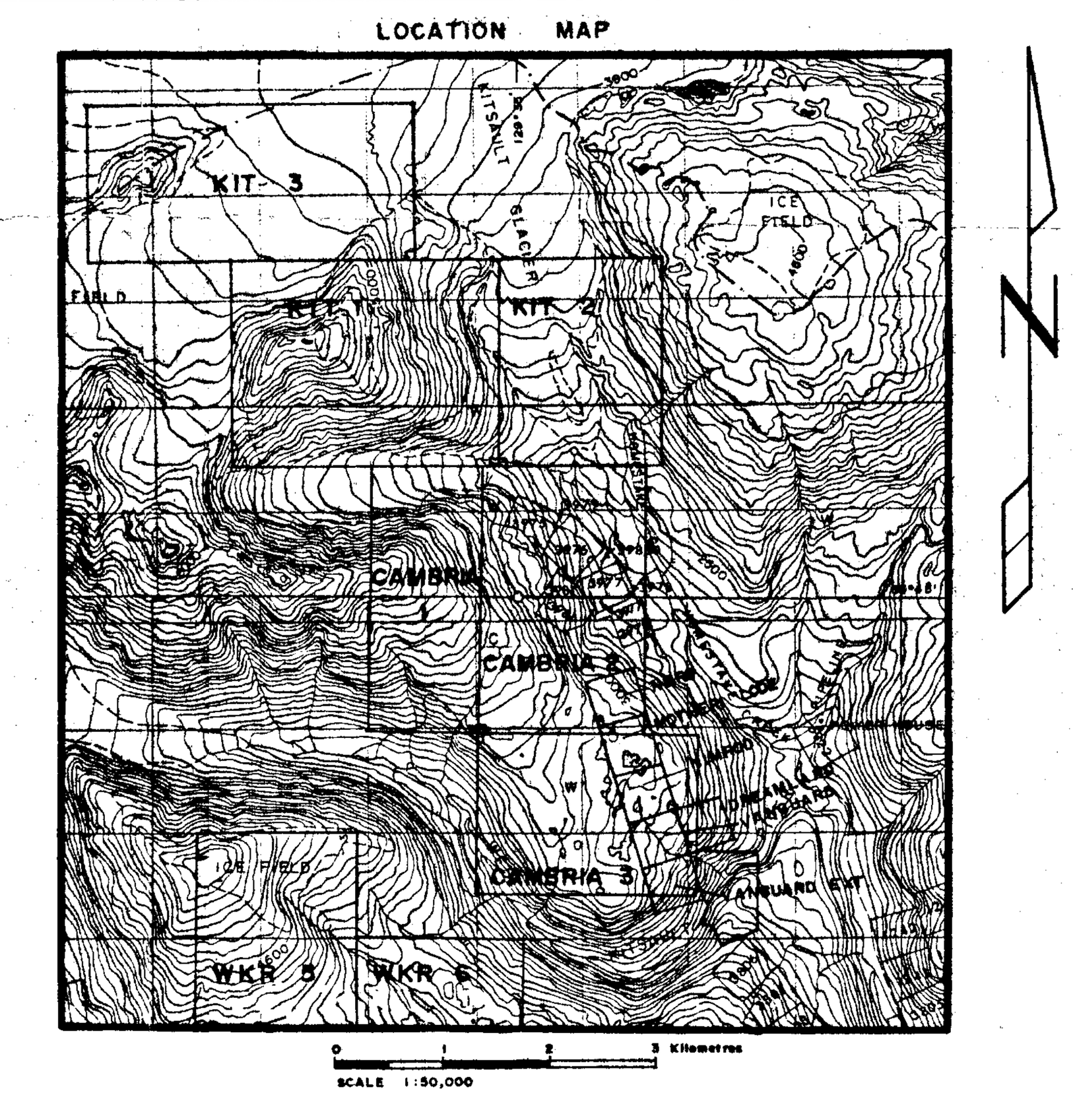

Contour Intervals : 1.0, 3.0, 5.0 ppm

100m 50m 0m 100m 200m

noranda
NORANDA EXPLORATION CO. LTD.

FIG. 5

HOMESTAKE

SOIL GEOCHEMICAL SURVEY
PPM Ag
PROJECT: HOMESTAKE PROJECT # : 245
BASELINE AZIMUTH : 315 Deg.

SCALE = 1: 5000 DATE : 8/ 1/89
SURVEY BY : R BAERG NTS : 103P12
FILE: C245HOM
NORANDA EXPLORATION

GEOLOGICAL BRANCH
ASSESSMENT REPORT
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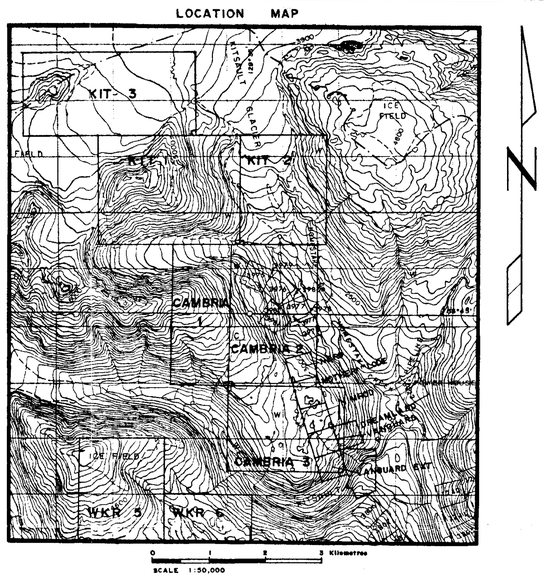
LOCATION MAP



Contour Intervals 100, 200, 500 ppm

Oct 23/89

HOMESTAKE

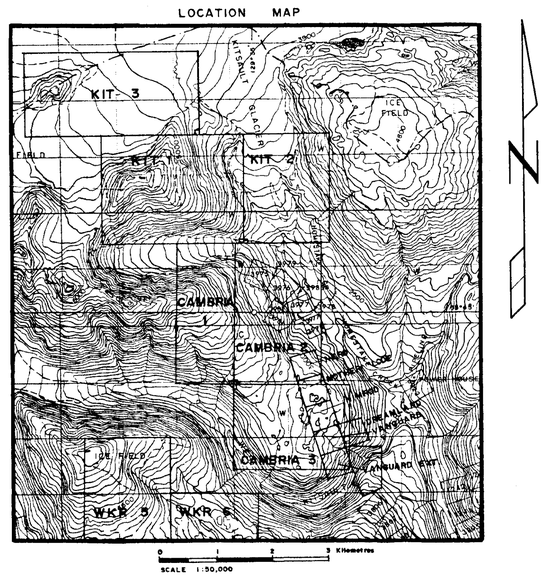
SOIL GEOCHEMICAL SURVEY
PPM Cu
PROJECT: HOMESTAKE PROJECT # : 245
BASELINE AZIMUTH : 315 Deg.

SCALE = 1: 5000 DATE : 8/ 1/89
SURVEY BY : R BAERG NTS : 103P12
FILE: C245HOM
NORANDA EXPLORATION

noranda
NORANDA EXPLORATION CO. LTD.

FIG. 6

LOCATION MAP



11700E
11500E
11300E
11100E
10900E
10700E
10500E
10300E
11800N
11700N
11600N
11500N
11400N
11300N
11200N
11100N
11000N
10900N
10800N
10700N
10600N
10500N
10400N
10300N
10200N
10100N
10000N
9900N
9800N
9700N
9600N
9500N
9400N
9300N
9200N
9100N
9000N
8900N
8800N
8700N
8600N
8500N
8400N

VANGUARD FAULT
NCRO
VANGUARD GOLD
MOTHERLODE
NIMROD
VANGUARD COPPER
DREAMLAND
DEMILO
VANGUARD
VANGUARD EXTENSION

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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Contour Intervals : 50, 100, 200 ppm

100m 50m 0m 100m 200m

HOMESTAKE

SOIL GEOCHEMICAL SURVEY

PPM Pb

PROJECT: HOMESTAKE PROJECT # : 245

BASELINE AZIMUTH : 315 Deg.

SCALE = 1: 5000 DATE : 8/ 1/89

SURVEY BY : R BAERG NTS : 103P12

FILE: C245HOM

NORANDA EXPLORATION

FIG. 7

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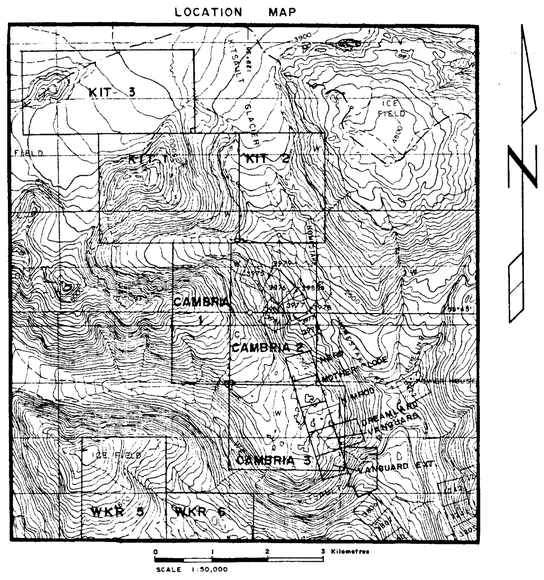
LOCATION MAP



11700E
11500E
11300E
11100E
10900E
10700E
10500E
10300E
11800N
11700N
11600N
11500N
11400N
11300N
11200N
11100N
11000N
10900N
10800N
10700N
10600N
10500N
10400N
10300N
10200N
10100N
10000N
9900N
9800N
9700N
9600N
9500N
9400N
9300N
9200N
9100N
9000N
8900N
8800N
8700N
8600N
8500N
8400N

VANGUARD
FAULT
NORO
VANGUARD GOLD
MOTHERLODE
NIMROD
VANGUARD COPPER
DREAMLAND
DEMILO
VANGUARD
VANGUARD EXTENSION

Contour Intervals : 100, 200, 500 ppm

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,189

Draft Chkd Oct 23/89

HOMESTAKE

SOIL GEOCHEMICAL SURVEY
PPM Zn
PROJECT: HOMESTAKE PROJECT # : 245
BASELINE AZIMUTH : 315 Deg.

SCALE = 1: 5000 DATE : 8/ 1/89
SURVEY BY : R BAERG NTS : 103P12
FILE: C245HOM
NORANDA EXPLORATION

noranda
NORANDA EXPLORATION CO. LTD.

FIG. 8