LOG NO: 0228
ACTION.
FILE NO:

Geological, Prospecting, and Geochemical Report
on the
Deb South Property
DEB 3 and 4 Mineral Claims
Skeena Mining Division
N.T.S. 104-B/7E
Latitude 56°21′ North
Longitude 130°42′ West
British Columbia

FILMED

GEOLOGICAL BRANCH
ASSESSMENT REPORT
19,721

November 6, 1989

on behalf of

ROSS RESOURCES LTD.

Calgary, Alberta

by

C. H. Aussant, B.Sc., P.Geol., F.GAC
- and -
D. G. DuPré, B.Sc., P.Geol., F.GAC

KEEWATIN ENGINEERING INC.
#800, 900 West Hastings Street
Vancouver, B.C. V6C 1E5

ABSTRACT

The Deb South property consists of two contiguous modified-grid claims totalling 40 units located approximately 80 km northwest of Stewart, British Columbia. Access to the property is by fixed-wing aircraft from Terrace, Stewart, or Smithers to various airstrips in the area and then via helicopter to the property.

The property lies within the Intermontaine Tectono-Stratigraphic Belt and occurs near the contact between the Stikine Terrane and the unmetamorphosed sediments of the Bowser Basin. The western portion of the property is underlain by diorites of the Coast Plutonic Complex with the low-lying eastern portion underlain by Pleistocene basalt flows.

The area has an exploration history dating back to the turn of the century when prospectors passed through the region on their way to the interior. In the 1970's, the porphyry copper boom again brought prospectors and companies into the area. The current gold exploration rush began in 1980 with the option of the Sulphurets property by Esso Minerals Canada and the acquisition of the Johnny Mountain claims by Skyline Exploration Ltd. which was brought into production in mid-1988. The adjacent SNIP property is slated for production in 1990.

At this time, the Eskay Creek prospect, located 35 km northeast of the Deb South property and currently being explored by Calpine and Consolidated Stikine, is the most significant showing in the area. The prospect comprises at least eight mineralized zones occurring over a strike length of 1800 m within a sequence of felsic volcanics. The mineralization is associated with disseminated sulphides in felsic volcanic breccias and graphitic argillites in contact with overlying intermediate volcanic rocks.

A review of all available information indicates that no work has been filed and no mineralized occurrences are known within the property area.

The 1989 exploration program consisted of helicopter-supported reconnaissance prospecting, geological mapping, and geochemical sampling with the objective of evaluating the property's potential for hosting economic precious metals deposits and for the purpose of fulfilling the assessment requirements.

Access to the property is limited due to precipitous topography and dense tree cover. An aerial reconnaissance over the property did not locate any gossanous areas, and the limited amount of reconnaissance prospecting completed did not locate any potentially mineralized areas. Consequently, there were no lithogeochemical samples collected. One stream silt sample was collected, which yielded only background values for all the elements.

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INTRODUCTION

Ross Resources Ltd. of Calgary, Alberta, commissioned Keewatin Engineering Inc. to conduct a field exploration program on the Deb South property located in the Unuk River area of northern British Columbia. Exploration was directed by Keewatin Engineering Inc. with geological support and field supervision provided by Taiga Consultants Ltd. as a sub-contractor to augment the Keewatin crew.

The objective of this program was to evaluate the property's potential for hosting economic precious metals deposits and for the purpose of fulfilling the assessment requirements. Exploration consisted of prospecting, geological mapping, and geochemical sampling.

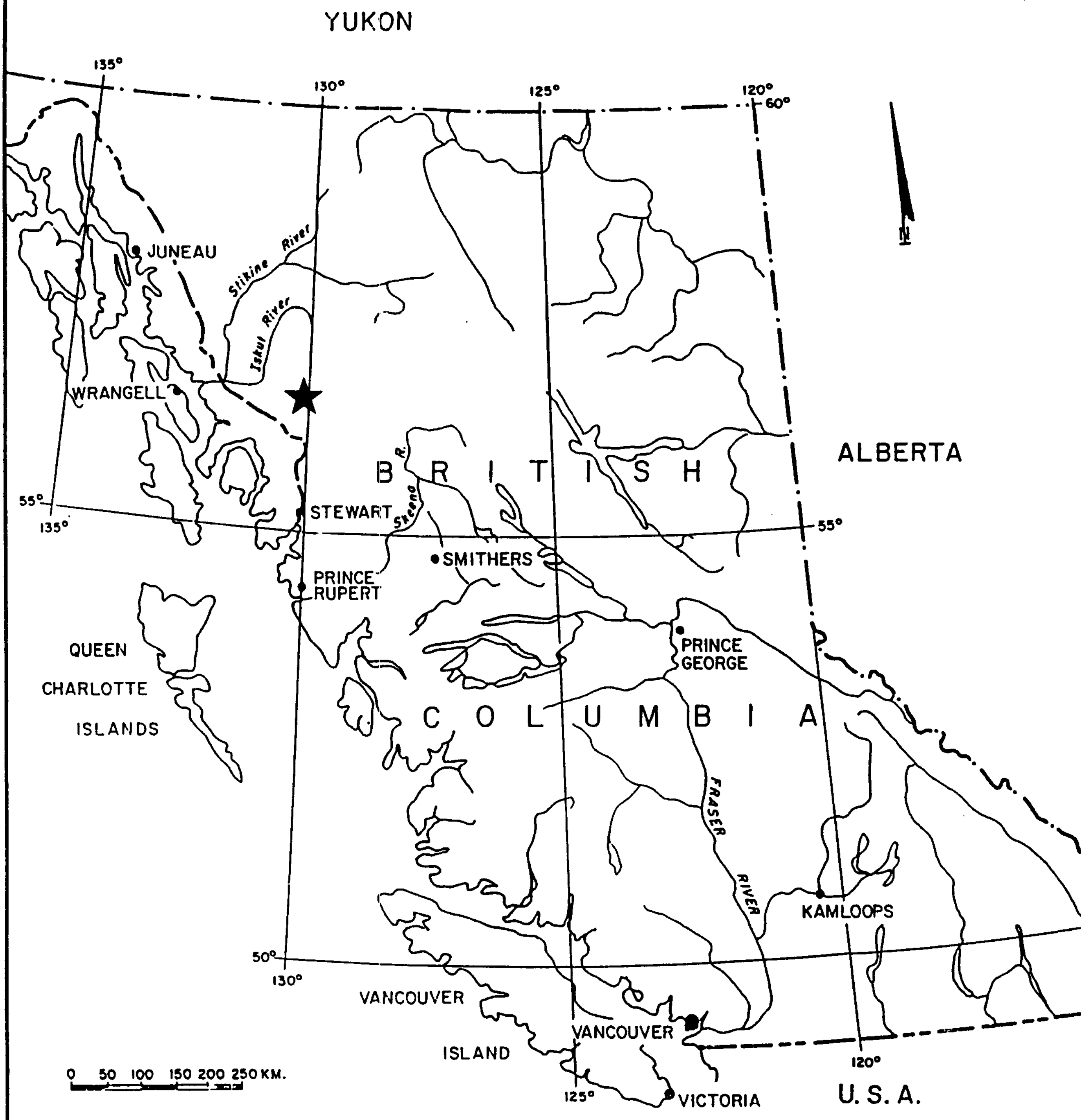
Location and Access

The Deb South property is located in northwestern British Columbia, approximately 80 km northwest of Stewart (Figure 1). The claims are situated within N.T.S. map-sheet 104-B/7E and centered about 56°21′ North latitude and 130°42′ West longitude. Access to the property is by fixed-wing aircraft from Terrace, Stewart, or Smithers to various airstrips in the area and then via helicopter to the property. The claims can also be directly accessed by helicopter from Stewart.

At some future date, road access to the area from the Stewart-Cassiar Highway could be obtained via the Upper Unuk River and Tiegen Creek valleys.

Property Status and Ownership

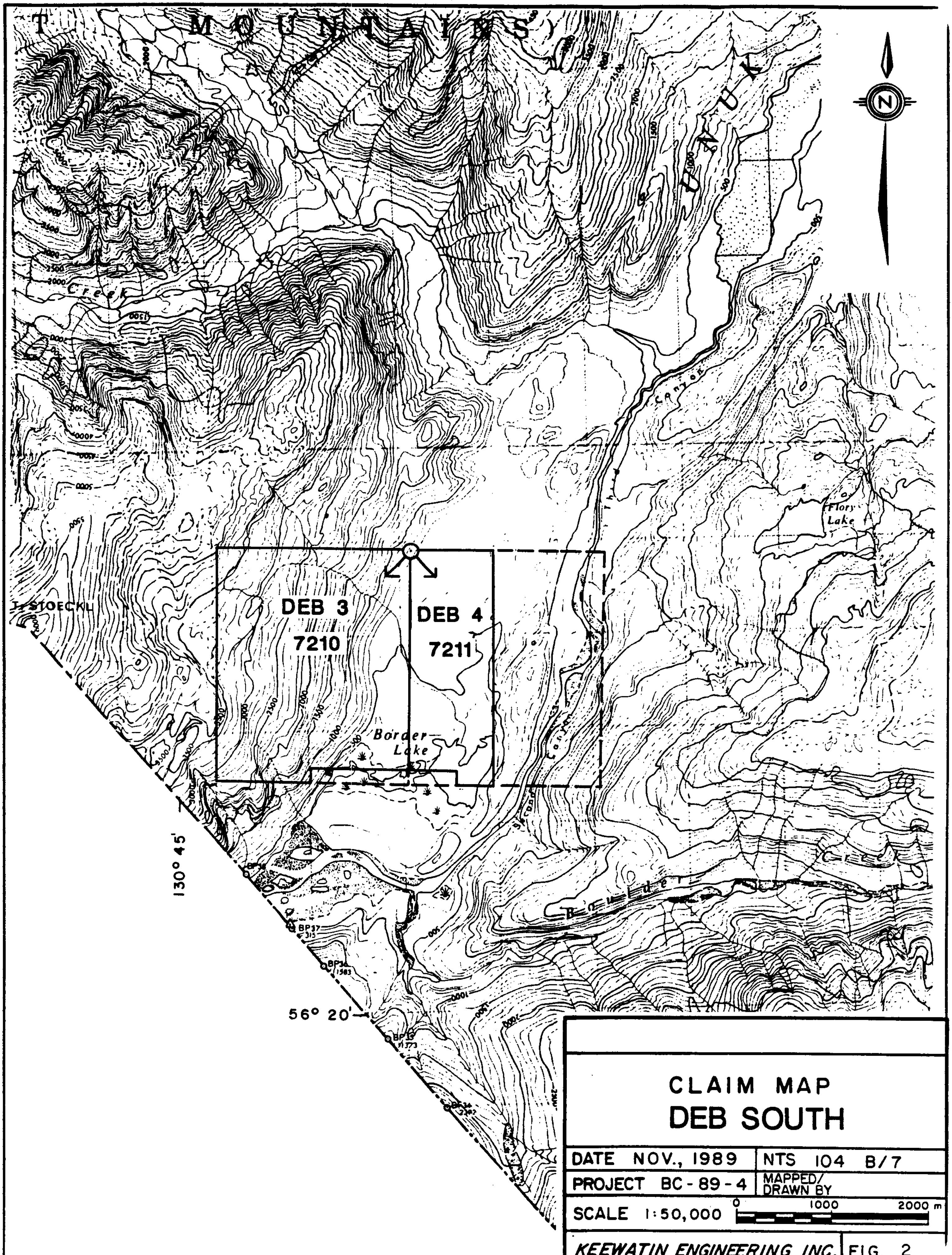
The Deb South property (Figure 2) consists of two modified-grid claims totalling 40 units, located within the Skeena Mining Division. Relevant claims data are tabulated below:



★ PROPERTY LOCATION MAP

Figure I

KEEWATIN ENGINEERING INC.



CLAIM MAP
DEB SOUTH

DATE NOV., 1989	NTS 104 B/7
PROJECT BC-89-4	MAPPED/ DRAWN BY
SCALE 1:50,000	0 1000 2000 m
KEEWATIN ENGINEERING INC.	FIG. 2

Claim Name	Record Number	No.of Units	Date of Record	Expiry Date
DEB 3	7210	20	Feb.17/89	1990
DEB 4	7211	20	Feb.17/89	1990

These claims are apparently the subject of an agreement between the claim holder (G. N. Ross) and Ross Resources Ltd. The claim maps show that the eastern half of the DEB 4 claim covers pre-existing mineral claims.

Physiography and Climate

The Deb south property is situated within the Coast Range Physiographic Division and is characterized by northern rain forests and sub-alpine plateaux. Valleys are steep-sided and U- to V-shaped. Elevations (see Figure 2) range from 120 m in the valley of the Unuk River to 1220 m.

A transitional treeline, characterized by dense sub-alpine scrub, meanders through the property at approximately the 915 m elevation. Terrain above tree-line is typified by intermontane alpine flora. Permanent glacial ice is found intermittently above the 1065 to 1370 m elevations. Conifers up to 30 m tall are common below treeline, especially in stream valleys. Water for camp and drilling purposes is generally in good supply from the numerous creeks draining the claim area.

Precipitation is heavy, exceeding 200 cm per annum, with short mild summers but very wet spring and fall periods. Thick accumulations of snow are common during winter. It is seldom possible to begin surface geological work before July and difficult to continue past September.

PREVIOUS EXPLORATION

The area drained by the upper reaches of the Stikine, Iskut, Unuk, Craig, and Bell-Irving Rivers has been explored for gold since the late 1800's when prospectors passed through the region on their way to the interior. In the 1970's, the porphyry copper boom again brought prospectors and companies into the area. The current gold exploration rush began in 1980 with the option of the Sulphurets property by Esso Minerals Canada and the acquisition of the Johnny Mountain claims by Skyline Explorations Ltd. The Johnny Mountain deposit was brought into production in mid-1988, and the adjacent SNIP property is slated for production in 1990.

The mineralization at Eskay Creek was discovered in 1932, and active prospecting has continued sporadically since then. Two adits are the result of limited mining activity on this prospect. In 1988, Calpine Resources Incorporated discovered high-grade gold and silver mineralization on the '21 Zone' (*Northern Miner* - November 7, 1988). A number of excellent diamond drill intersections have been obtained to date, including drill hole CA-88-06 which encountered 96 feet of 0.752 oz/ton gold and 1.13 oz/ton silver. Based on the results of 70 drill holes completed to June 1, 1989, a preliminary geological ore reserve of 2.8 million tons grading 0.23 oz/ton gold and 3.3 oz/ton silver has been calculated for the '21 Zone' (Consolidated Stikine Silver Ltd. - 1989 Annual Report).

The Unuk River area was covered by regional geological mapping in 1988 as part of the Iskut-Sulphurets project carried out by B.C. Ministry of Energy, Mines and Petroleum Resources (Britton, et al.,1989). The whole of N.T.S. 104-B is currently being mapped by R. G. Anderson of the Geological Survey of Canada (Anderson, 1989).

The results of a regional stream sediment sampling program conducted over this area were released in July 1988 (National Geochemical Reconnaissance, 1988). Britton (et al.) report that almost every known precious metal prospect in the Unuk River area is associated with high stream sediment gold values. Known gold deposits are also associated with high but variable values for such pathfinder elements as silver, arsenic, antimony, and barium. No samples were collected from the creeks draining the property area.

A review of the material in the B.C. Ministry of Energy, Mines and Petroleum Resources assessment report archives indicates that no work has been filed for the specific area now covered by the Deb South property. However, the files do show that the entire Unuk River area was subjected to reconnaissance geological mapping and prospecting by Newmont Mines Ltd. during the period 1959 to 1962. This work did not discover any promising showings or prospects on the present Deb South property.

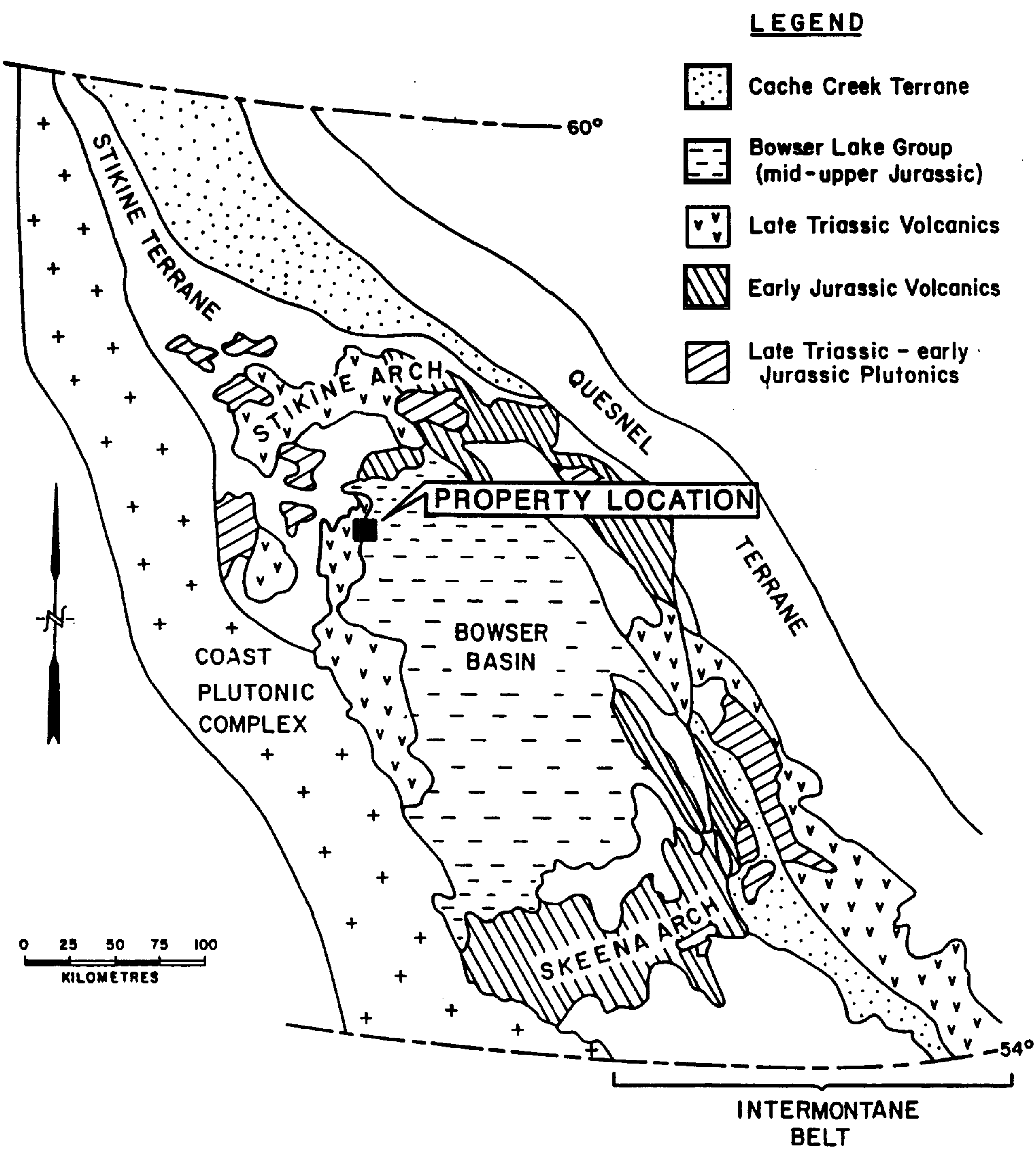
The assessment records (Korenic, 1982) indicate that Duval Corp. undertook a regional heavy mineral survey in the Unuk River area in 1981.

REGIONAL GEOLOGY

The property lies within the Intermontane Tectono-Stratigraphic Belt, one of five parallel northwest-southeast trending belts which comprise the Canadian Cordillera (Figure 3). The Deb South property occurs near the contact between the Stikine Terrane, which makes up most of the western part of the Intermontane Belt, and the unmetamorphosed sediments of the Bowser Basin.

The Unuk River area (Figure 4) is underlain by a thick succession of Upper Triassic to Lower Jurassic volcano-sedimentary arc complex lithologies capped by Middle Jurassic marine basin lithologies. This package has been intruded by a variety of plutons representing at least four intrusive episodes spanning late Triassic to Tertiary time. These include synvolcanic plugs, small stocks, dyke swarms, isolated dykes and sills, as well as batholiths belonging to the Coast Plutonic Complex.

The stratigraphic sequence has been folded, faulted, and weakly metamorphosed during Cretaceous time, but some Triassic strata are polydeformed and may record an earlier deformational event. Remnants of Pleistocene to Recent basaltic flows and tephra are preserved locally.



REGIONAL GEOLOGY
BOWSER BASIN
NW BRITISH COLUMBIA

(Outline of terrane boundaries and major rock groups of the Jurassic and Triassic — modified from Thomson, 1985).

Figure 3

KEEWATIN ENGINEERING INC.

LEGEND

INTRUSIVE ROCKS

Eocene:
- King Creek Dyke Swarm
- Coast Plutonic Complex
- Lee Brant Stock

Jurassic: Lehto Porphyry

L Jurassic to U Triassic: Diorite and Gabbro: Nickel Mountain (nm), John Peaks (jp), Melville (mv), Max (mx)

U Triassic: Meta-quartz-diorite

STRATIFIED ROCKS

Recent to Pleistocene: Basalt Flows and Tephra

M Jurassic: 4 Marine-basin Turbidites; 3 Felsic Pyroclastics

L Jurassic – U Triassic: 2 D V S; 1 V S

D = Dacite Marker
V = Andesitic Volcanics (with <40% sediments)
S = Sediments (with <40% volcanics)

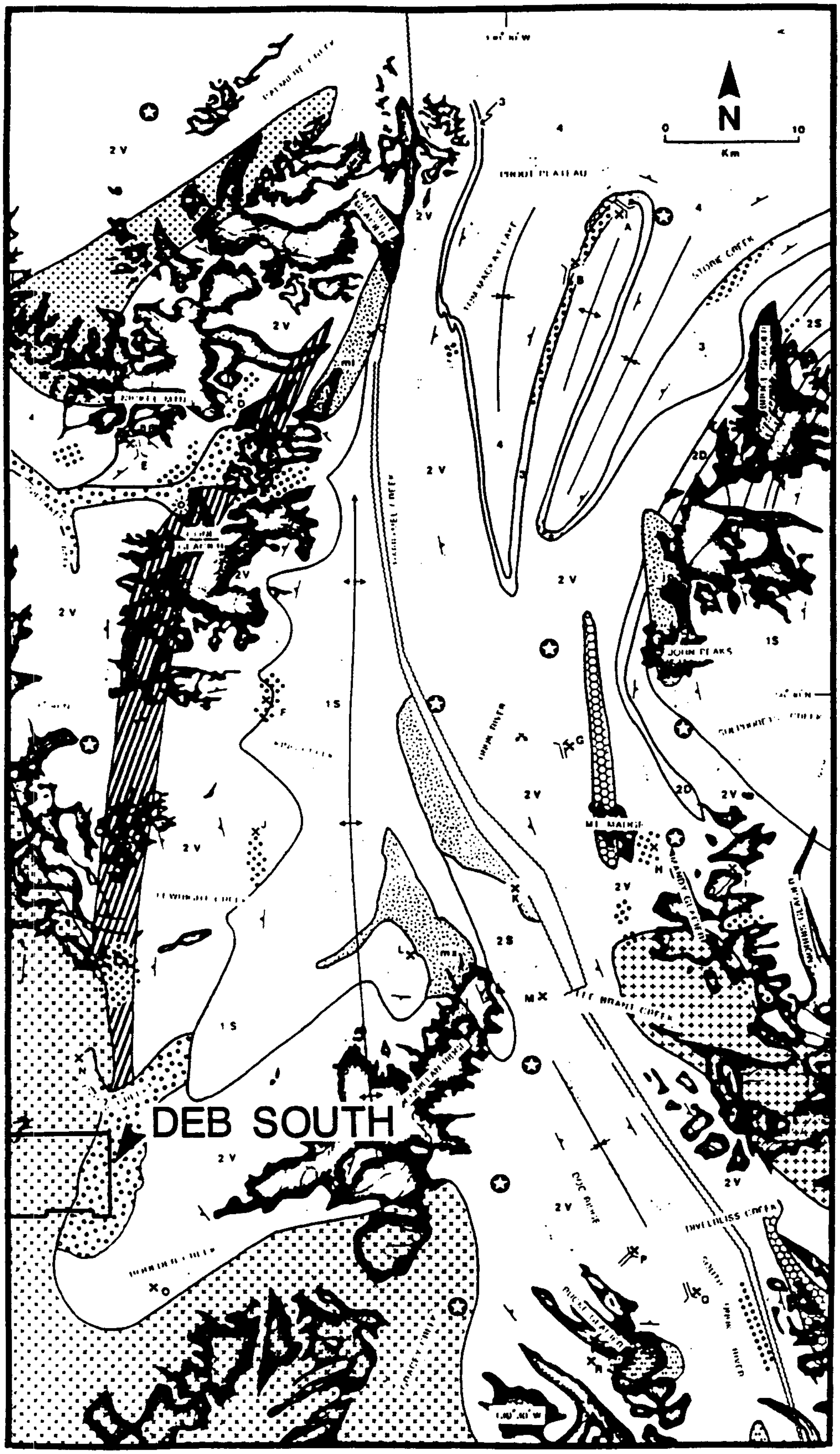
SYMBOLS

- Compositional layering (bedding; foliation)
- Contact
- Anticline, syncline
- Harrymel-South Unuk shear
- Pillow lavas
- Recent volcanic vent
- Gossan
- Adit
- Stream sediment gold values >90th percentile
- Mineral occurrence
- Placer occurrence

MINERAL OCCURENCES

	NAME	COMMODITY
A	Emma	Au,Ag,Pb,Zn,Cu
B	MacKay	Au,Ag,Pb,Zn,Cu
C	Copper King	Cu,Fe
D	Colagh	Cu
E	E&L Nickel	Ni,Cu
F	Cole	Cu,Au,Ag
G	Cumberland/Daly	Au,Ag
H	Mt. Madge (C-10)	Au,Ag,Zn
I	Mt. Madge (GFJ)	Au,Ag,Cu,Zn
J	VV	Cu,Mo,Au,Ag
K	Chris & Anne	Cu,Fe
L	Max	Fe,Cu
M	Unuk Jumbo	Fe,Cu
N	Black Bear	Au,Pb,Zn
O	Boulder Creek	Pb,Zn,Au,Cu
P	Doc	Au,Ag,Pb,Cu
Q	Globo	Au,Ag,Pb,Cu
R	Alf	Au,Ag

NOTE: Not to scale



Geology and mineral deposits, Unuk map area.
Modified after Britton et. al. (1989)

PROPERTY GEOLOGY

Figure 4

PROPERTY GEOLOGY

Regional geological mapping by Britton et al.(1989) shows that the claims are underlain by the Coast Plutonic Complex on the west, and by Pleistocene basalt flows on the east (Figure 5).

Pleistocene to Recent Basalt Flows and Tephra (Unit 6a)

Britton et al.(1989) mapped these flows along the valleys of the Unuk River and Canyon Creek. The are reported to commonly display columnar jointing.

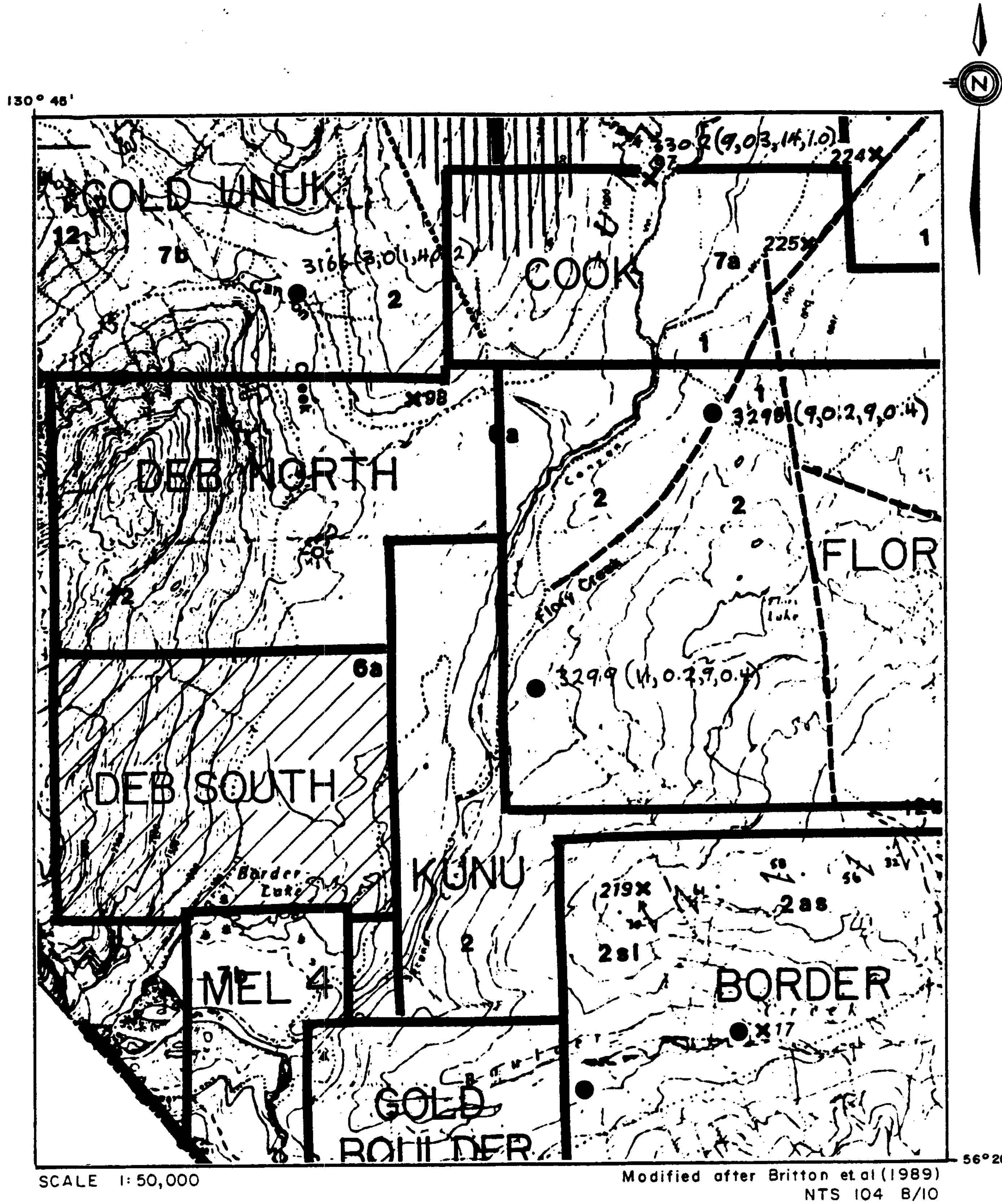
Eocene and possibly Jurassic Coast Plutonic Complex (Unit 12)

Britton et al.(1989) described the intrusions as ranging in composition from biotite granite to biotite-hornblende quartz diorite. Numerous discrete stocks are probably present. The country rock contacts are reported to be sharp, discordant, and thermally metamorphosed. The age of these intrusives is Eocene, but the complex may include remnants of Jurassic granitoids.

Structure

Actual fault surfaces or zones are rarely seen in the Unuk River area, but they are probably quite common and may have developed concurrently with regional folding.

Britton et al.(1989) mapped several assumed faults to the north and east of the property boundaries. These are assumed to be normal faults and are described as megascopic structures with relatively little offset.



DEB SOUTH
PROPERTY GEOLOGY

Figure 5

LEGEND

INTRUSIVE ROCKS

TERTIARY

13 *POST-TECTONIC DYKES*

- 13a *Lamprophyre, andesite, diabase (likewise not shown)*
- 13b *King Creek Dyke Swarm: feldspar porphyry dacite, andesite, diabase, quartz diorite*
- 13c *Hawkeye monzonite: fine-grained leuco-monzonite*

12 *COAST PLUTONIC COMPLEX*

- 12a *Biotite granite*
- 12b *Hornblende-biotite quartz diorite*
- 12c *Lee Brant Stock: K-feldspar porphyry, hornblende-biotite quartz monzonite*

JURASSIC

11 *NICKEL MOUNTAIN GABBRO: metasomatic olivine-pyroxene gabbro*

10 *SYN TO POST-VOLCANIC INTRUSIONS: Porphyritic to phaneritic textured; possibly hypabyssal equivalents of extrusive rocks*

- 10a *Lehto Porphyry: K-feldspar-plagioclase-hornblende porphyry granodiorite to syenite*
- 10b *Bob Lake Dyke: fine- to medium-grained hornblende diorite*
- 10c *Andesite-Diorite Complex: metasomatic, fine- to medium-grained diorite with abundant xenoliths of dark green meta-andesite; (possibly Triassic)*

9 *UNUK RIVER DIORITE SUITE: medium- to coarse-grained, mafic to intermediate stocks*

- 9a *John Peaks metasomatic hornblende diorite*
- 9b *Max biotite-hornblende diorite; quartz diorite*
- 9c *Melville hornblende-biotite diorite to quartz diorite*
- 9d *Doc Ridge biotite monzodiorite*

TRIASSIC

8 *BUCKE GLACIER STOCK: light grey, gneissic to foliated, medium-grained hornblende-biotite quartz diorite*

METAMORPHIC ROCKS

A - F *METAMORPHIC EQUIVALENTS OF UNITS 1, 2 OR 3*

- A *Metapelite: dark grey, carbonaceous quartz-feldspar-sericite phyllite*
- B *Felsic metavolcanics: light green, quartz-albite-chlorite-sericite phyllite; locally with deformed lapilli*
- C *Mafic to intermediate metavolcanics: dark green, plagioclase-chlorite phyllite*
- D *Hornblende-plagioclase mylonite; mylonitic meta-tuffs*
- E *Hornblende-plagioclase gneiss; agmatitic migmatite*
- F *Strongly sheared rocks within the Unuk-Harrymel fault zone*

GOSSANOUS ALTERATION ZONES

- (dot pattern) *Pyrite ± quartz ± sericite ± carbonate ± clay; locally foliated to schistose*
- (hatch pattern) *Disseminated pyrite in felsic volcanics*

VOLCANIC AND SEDIMENTARY ROCKS

(Note: No stratigraphic order is implied within sequences.)

QUATERNARY

RECENT

7 *UNCONSOLIDATED SEDIMENTS*

- 7a *Alluvium, glaciofluvial deposits, landslide debris, moraine*
- 7b *Alluvium underlain by Pleistocene to Recent basalt*

PLEISTOCENE TO RECENT

6 *BASALT FLOWS AND TEPHRA*

- 6a *Dark grey to black, basalt flows and tephra; minor pillow lavas*
- 6b *Basalt tephra*

TRIASSIC TO JURASSIC

HAZELTON GROUP

MIDDLE JURASSIC (TOARCIAN TO BAJOCIAN)

5 *SILTSTONE SEQUENCE (Salmon River Formation): Dark grey, well-bedded siltstone with minor sandstone and conglomerate.*

- 5c *Chert pebble conglomerate and arenite*
- 5t *Rhythmically bedded siltstone and shale (turbidite)*
- 5w *Thinly bedded wacke*
- 5p *Andesitic pillow lavas and pillow breccias with minor siltstone interbeds*

LOWER JURASSIC (TOARCIAN)

4 *FELSIC VOLCANIC SEQUENCE (Mount Dilworth Formation): Light weathering, intermediate to felsic pyroclastic rocks, including dust, ash, crystal and lithic tuffs, lapilli tuff. Locally pyritiferous (1 to 15%) and gossanous. Minor chalcedonic quartz veins locally.*

- 4a *Variably bedded airfall tuffs*
- 4f *Massive felsic tuff*
- 4r *Black and white, carbonaceous felsic volcanics; locally flow banded and autobrecciated*

LOWER JURASSIC (PLIENSBACHIAN TO TOARCIAN)

3 *PYROCLASTIC-EPICLASTIC SEQUENCE (Betty Creek Formation): Heterogeneous, grey, green, locally purple or maroon, massive to bedded pyroclastic and sedimentary rocks; pillow lava*

- 3a *Green and grey, massive to poorly bedded andesite*
- 3d *Grey, green and purple dacitic tuff, lapilli tuff, crystal and lithic tuff; massive to well bedded; feldspar phyric*
- 3f *White weathering, felsic tuffs and breccias with quartz stringers*
- 3s *Andesitic lapilli tuff with pink siliceous clasts*
- 3p *Andesitic pillow lavas and pillow breccias with minor siltstone interbeds*
- 3t *Black, thinly bedded siltstone, shale and argillite (turbidite)*

UPPER TRIASSIC TO LOWER JURASSIC (NORIAN TO SINEMURIAN)

2 *ANDESITE SEQUENCE (Unuk River Formation): Green and grey, intermediate to mafic volcaniclastics and flows with locally thick interbeds of fine-grained immature sediments; minor conglomerate and limestone*

- 2a *Grey and green, plagioclase ± hornblende porphyritic andesite; massive to poorly bedded*
- 2h *Grey and green, hornblende-(± pyroxene)-feldspar porphyritic andesitic lapilli and ash tuff*
- 2s *Grey, brown and green, thinly bedded, tuffaceous siltstone and fine grained wacke*
- 2t *Black, thinly laminated siltstone (turbidite); shale; argillite*
- 2g *Dark grey, matrix-supported conglomerate with granitic cobbles*
- 2l *Grey, variably bedded limestone (completely recrystallized along South Unuk valley)*

TRIASSIC

STUHINI GROUP

UPPER TRIASSIC (CARNIAN TO NORIAN)

1 *LOWER VOLCANOSEDIMENTARY SEQUENCE: Brown, black and grey, mixed sedimentary rocks intercalated with medium to dark green, mafic to intermediate volcanic and volcaniclastic rocks*

- 1t *Grey to black, thinly bedded siltstone, shale, argillite (turbidite)*
- 1w *Brown and grey, fine grained tuffaceous wacke; minor siltstone or conglomerate*
- 1l *Grey, impure, silty, sandy limestone*
- 1a *Green, fine-grained, andesitic ash tuff; feldspar and hornblende phyric*
- 1b *Dark green basalt*
- 1p *Grey and green, andesitic breccia with augite-hornblende-plagioclase clasts and augite-rich matrix*

SYMBOLS

- Geological boundary (defined, approximate, assumed)
- Bedding, tops known (horizontal, inclined, vertical, overturned)
- Bedding, tops unknown (horizontal, inclined, vertical)
- Bedding, estimated dip (gentle, moderate, steep)
- Stratigraphic tops in pillow volcanics
- Compositional layering in metamorphosed rocks; foliation (inclined, vertical)
- Trend line
- Regional anticline; syncline
- Antiform; synform (normal, overturned)
- Minor fold axis with M, Z or S symmetry; with plunge
- Fault (defined, assumed; D = downthrown side)
- Thrust fault (defined, assumed; teeth on upper plate)
- Air photo lineament
- Fossil locality
- Flora
- Area with more than 40% Tertiary dykes
- Limit of major phyllite zone
- Volcanic vent (observed, assumed)
- Geologic station
- National geochemical reconnaissance sample site — 871365 (0.8,48,3.8,11) Sample No. (Ag ppm, As ppm, Sb ppm, Au ppb)
- Potassium-argon isotopic age site; H = hornblende; age in millions of years before present
- Mineral occurrence; MINFILE number — X83

AGE	GROUPS	FORMATIONS	MEMBERS	LITHOLOGIES
Bathonian	Bowser Lake	Ashman	Main Sequence Basal Conglomerate	Turbidites, wackes, intraformational conglomerates Chert pebble conglomerates
Bajocian to Toarcian	Spatsizi(?)	Salmon River	Pyjama Beds Basal Limestone	Thin bedded, alternating siltstones and mudstones Gritty, fossiliferous limestone
Toarcian		Mount Dilworth	Upper Lapilli Tuff Middle Welded Tuff Lower Dust Tuff	Dacitic lapilli tuff with flow-bandedd clasts Dacitic welded ash flow and lappilli tuff Dacitic dust tuff
Pliensbachian	Hazelton	Betty Creek	Sedimentary Members Volcanic Members	Hematitic volcaniclastic sediments, and turbidites Andesitic to dacitic tuffs and flows
Sinemurian to Hettangian(?)		Unuk River	Premier Porphyry Upper Andesite Upper Siltstone Middle Andesite Lower Siltstone Lower Andesite	Two feldspar + hornblende porphyritic tuffs Massive tuffs with local volcaniclastic sediments Turbidites, minor limestones Massive tuffs and minor volcaniclastic sediments Turbidites Massive to bedded ash tuffs
Norian to Carnian	Stuhini		Volcanic Members Sedimentary Members	Pyroxene porphyry flows and tuffs Turbidites, limestones, conglomerates

TABLE 1. Table of Formations Unuk River Area

ECONOMIC GEOLOGY

Britton et al.(1989) list 55 mineral occurrences in the Unuk map-sheet. These showings are predominantly gold/silver occurrences and are hosted by a number of various lithologies. Most can be classified into one of four categories: stratabound, vein, skarn, and disseminations. Grove (1986) has determined that the age of the mineralizing events is variable and, notably, can be post-Triassic.

Stratabound mineralization consists almost exclusively of pyritic zones and lenses contained within a particular stratum or a restricted set of strata. The best example is the Eskay Creek prospect, currently being explored by Calpine Resources Incorporated and Consolidated Stikine Silver Ltd. Intrusive-contact (skarn) deposits show a close spatial and temporal relationship with igneous intrusions. Three deposits in this category are the E & L nickel/copper deposit (Minfile #006), the Max copper/iron skarn (Minfile #013), and the Chris-Anne copper/iron skarn (Minfile #125). Britton et al.(1989) stated:

> Mineralization at the E & L occurs within two medium- to coarse-grained, olivine-pyroxene gabbro bodies. These roughly triangular plugs are each approximately 1300 square metres in area and are probably connected. They intruded a sequence of argillites, tuffaceous siltstones, and grey dacitic ash tuffs that strike northwest with moderate to steep southwesterly dips. Mineralization consists of pyrrhotite, pentlandite, and chalcopyrite, with lesser amounts of pyrite and magnetite. In the northwestern gabbro, mineralization extends up to the contact with the sediments, whereas in the southeastern gabbro, mineralization is confined to the pluton. Diamond drilling has delineated pipelike pods and disseminations of sulphides to a depth of 120 metres. Drill-indicated reserves are 2.8 million tonnes of 0.7% Ni and 0.6% Cu (Sharp, 1965).
>
> The Max prospect lies on the northwest side of McQuillan Ridge, between the Unuk and South Unuk Rivers, at elevations between 455 and 1500 metres. Massive magnetite with lesser pyrrhotite and chalcopyrite occur in skarn-altered sedimentary rocks adjacent to a diorite stock. Garnet, epidote, actinolite, and diopside characterize the skarn assemblage. Drilling has indicated a reserve of 11 million tonnes at 45% iron (Canadian Mines Handbook 1973-1974, page 432).
>
> The Chris-Anne prospect lies approximately 3 kilometres east of the Max. Skarn mineralization is reported in limestone beds which are up to 10 metres thick and that are interbedded with volcaniclastics. Magnetite and pyrrhotite-rich layers, from 0.5 to 7 metres

thick, with minor chalcopyrite, extend over a distance of 1 km. There are minor intrusive bodies reported on the property. Grades range from 0.1% to 0.4% copper (Allan and MacQuarrie, 1981).

The gold potential of these skarn deposits does not appear to have been tested. Based on recent skarn studies (Ettlinger and Ray, 1988), this area has many features that are associated with gold-enriched skarns elsewhere in the province: sequences of calcareous and tuffaceous host rocks; structural deformation; intrusion by dioritic I-type granitoids; and contact metamorphism and recrystallization. Some auriferous skarns are enriched in cobalt, an element that may be a useful pathfinder.

High-grade precious metal quartz veins are the target of exploration programs at Mount Madge (Minfile #240 and #233) by Bighorn Development Corporation, and at the Doc prospect (Minfile #014) by Echo Bay Mines Limited. Britton et al.(1989) reported:

> The Mount Madge prospects are located south of Sulphurets Creek near its confluence with Unuk River, on the east and west sides of Mandy Glacier. Two different targets are being evaluated (Kruchkowski and Sinden, 1988). On the west, the C-10 prospect (Minfile #240) is a stockwork of thin quartz veinlets, locally with thicker quartz lenses, in intensely altered, fine-grained tuffaceous andesite or dacite. Quartz veinlets locally form up to 30% of the rock. The alteration assemblage consists of quartz and sericite with up to 10% pyrite. Chalcopyrite and traces of sphalerite are also present. The rocks are strongly foliated to schistose and are very similar to the broad alteration zones seen at Brucejack Plateau 12 kilometres to the northeast (Britton and Alldrick, 1988). Soil samples locally return analyses in excess of 1 ppm gold.
>
> Two kilometres to the east, Ken Konkin discovered a massive pyrite-siderite float boulder with visible gold. Prospecting uphill led to the discovery of the GFJ veins (Minfile #233), apparently flat-lying, zoned siderite-quartz-sulphide veins that returned assays up to 121 grams per tonne gold (Kruchkowski and Sinden, 1988). The veins are poorly exposed. Float blocks seen this year display symmetrical zoning from margin to core across vein widths of 10 to 15 centimetres. Vein margins are 1 to 2 centimetres of thin white quartz layers separated by hairline accumulations of very fine-grained tin-white sulphide, probably arsenopyrite. The core is a very coarse-grained intergrowth of siderite, milky quartz, and cubes and clusters of pyrite, with lesser amounts of sphalerite and chalcopyrite as crystals and irregular masses. Rare tetrahedrite and visible gold have been observed (K.Konkin, personal communication, 1988). The veins cut variably foliated andesitic ash tuffs with thin interbeds of foliated to schistose siltstones.

The Doc prospect (Minfile #014) is located at treeline on a ridge overlooking the South Unuk River, opposite the mouth of Divelbliss Creek. The prospect consists of several west-northwest trending quartz veins up to 2 metres wide that have surface strike lengths of up to 275 metres (Gewargis, 1986). The main veins (Q17, Q22) are massive white quartz with sparse sulphide mineralization (5% to 10%) consisting of galena, pyrite, chalcopyrite, and sphalerite, with associated specular hematite and magnetite. Precious metal values are mostly confined to the sheared edges of veins and immediately adjacent wallrock. Shear zones with very little quartz may also return good values. Seraphim (1948) observed that gold was associated with either specular hematite or with galena and pyrite, but not with chalcopyrite and pyrite assemblages. The veins are a true fissure type, crosscutting folded and metamorphosed andesitic tuffs and thin-bedded sediments, including marble, that have been intruded by irregular dioritic dykes or sills and small monzodioritic plugs. The veins are different from any others seen in the Sulphurets or Unuk map areas. They have very restricted wallrock alteration aureoles, no apparent zoning, and appear to be limited to a few large fluid pathways. In this, they display characteristics of mesothermal veins. Structural control of the vein sets has not been determined but may be due to fractures related to folds in the host rocks. Total mineral inventory of the Q17 and other veins is given as 426,000 tonnes with 9.26 grams per tonne gold and 44.91 grams per tonne silver (*Northern Miner*, November 7, 1988).

Porphyry-type disseminated pyrite, chalcopyrite, and molybdenite mineralization occurs immediately north and south of King Creek, west of Harrymel Creek. Two properties have been worked: the VV to the south and the Cole to the north.

The VV property (Minfile #079) is the site of a heavily weathered monzonitic intrusive body in fault contact, on the east and west, with layered andesitic lapilli tuffs and tuff breccias with minor siltstone and calcareous sandstone interbeds. The stock is 250 metres wide, at least 6 kilometres long, strikes northerly, and dips steeply to the west, parallel to the country rocks. Chalcopyrite occurs in quartz stockworks and as fine disseminations within the monzonite. Molybdenite, sphalerite, malachite, and azurite have also been reported (Winter and McInnis, 1975; Mawer et al.,1977). Representative assays give 0.34% copper, 0.003% molybdenum, 2.1 grams per tonne silver, and 0.8 gram per tonne gold. Maximum gold and silver values obtained were 8.65 grams per tonne gold and 19.54 grams per tonne silver (Mawer et al.,1977).

The Cole prospect (Minfile #209) is situated approximately 4 kilometres north of the VV claims; it appears to be on strike with the same fault system and has similar intrusive and country rocks. Mineralization consists of up to 10% pyrite as disseminations and fracture fillings. Minor chalcopyrite and malachite have been reported but the bedrock source of the gold/silver soil anomalies has not been located (Korenic, 1982; Gareau, 1983). Reported assays range up to 0.43% copper, 7.12 grams per tonne gold, and 13.03 grams per tonne silver. Gold and copper values show a positive correlation on both properties.

At this time, the Eskay Creek prospect, located 35 km northeast of the Deb South property, is the most significant showing in the area. This prospect comprises at least eight mineralized zones occurring over a strike length of 1800 m within a sequence of felsic volcanics (Mount Dilworth Formation). This property is currently being explored by Calpine and Consolidated Stikine Silver. Preliminary drilling on the '21 Zone' intersected 96 feet assaying 0.752 oz/ton gold and 1.13 oz/ton silver including 52.5 feet grading 1.330 oz/ton gold and 1.99 oz/ton silver (*Northern Miner*, November 7, 1988).

The drilling results obtained to date indicate that the '21 Zone' extends over 335 m and is open along strike and at depth. Based on the results of 70 drill holes completed to June 1, 1989, a preliminary geological reserve of 2.8 million tons grading 0.23 oz/ton gold and 3.3 oz/ton silver was calculated for the '21 Zone' (Consolidated Stikine Silver, 1989 Annual Report). These deposits have been variously described as silicified shear zones (Harris, 1985) or as volcanogenic deposits (Donnelly, 1976). The mineralization is associated with disseminated sulphides in felsic volcanic breccias and graphitic argillites in contact with overlying intermediate volcanic rocks.

A review of all the available information (Minfile, assessment reports, geological maps, reports, etc.) indicates that no mineralized occurrences are known within the area currently covered by the Deb South property.

1989 EXPLORATION PROGRAM

The 1989 property exploration program, completed between September 9 and October 16, consisted of helicopter-supported reconnaissance prospecting, geological mapping, and geochemical sampling.

The accompanying map depicts the property geology (modified after Britton et al.,1989), with 1989 prospecting traverses, sample locations, and Au/Ag/As/Sb analytical results.

Diorites of the Coast Plutonic Complex underlie the western half of the property and the eastern edge of the DEB 4 claim near Border Lake. The remaining property area is underlain by Pleistocene basalt.

An aerial reconnaissance over the property did not locate any gossans within the property boundaries. Access to the Deb South property is limited due to precipitous topography and dense tree cover.

Reconnaissance prospecting was completed over the upland areas on the western portion of the DEB 3 claim and near the diorite/basalt contact in the southeast corner of the DEB 3 claim. There were no potentially mineralized areas located during the current exploration program; consequently, no lithogeochemical samples were collected. One stream silt sample was collected, yielding only background values for all the elements.

Future exploration of the property should consist of additional reconnaissance prospecting combined with geological mapping and geochemical sampling (lithogeochemical and stream silt). If no mineralized zones are located during the next phase of exploration, the property should be allowed to lapse.

SUMMARY AND RECOMMENDATIONS

The 1989 exploration program consisted of helicopter-supported reconnaissance prospecting, geological mapping, and geochemical sampling, with the objective of evaluating the property's potential for hosting economic precious metals deposits and for the purpose of fulfilling the assessment requirements.

The limited amount of reconnaissance prospecting and geological mapping completed confirmed the geology as shown on regional geological maps of the area. Diorites of the Coast Plutonic Complex underlie the western half and the eastern edge of the property, with Pleistocene basalt flows underlying the remaining low-lying areas.

Access to the property is limited due to the precipitous topography and dense tree cover. An aerial reconnaissance did not locate any gossans within the property boundaries, and the limited amount of reconnaissance prospecting completed did not locate any potentially mineralized areas. Consequently, no lithogeochemical samples were collected. One stream silt sample was collected, yielding only background values for all the elements.

Future exploration of the property should consist of additional reconnaissance prospecting combined with geological mapping and geochemical sampling (lithogeochemical and stream silt). A structural airphoto study should be completed over the property area to help direct the next phase of exploration into areas of potential shearing. If no mineralized zones are located, the property should be allowed to lapse.

CERTIFICATE - C. H. Aussant

I, Claude Henry Aussant, of 31 Templebow Way N.E. in the City of Calgary in the Province of Alberta, do hereby certify that:

1. I am a Consulting Geologist with the firm of Taiga Consultants Ltd. with offices at Suite 400, 534 - 17th Avenue S.W., Calgary, Alberta.

2. I am a graduate of the University of Calgary, B.Sc.Geology (1976), and I have practised my profession continuously since graduation.

3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta; and I am a Fellow of the Geological Association of Canada.

4. I am the author of the report entitled "Geological, Prospecting, and Geochemical Report on the **Deb South Property**, DEB 3 and 4 Mineral Claims, Skeena Mining Division, British Columbia", dated November 6, 1989. I personally worked on the property during the program described herein.

5. I do not own or expect to receive any interest (direct, indirect, or contingent) in the property described herein nor in the securities of **Ross Resources Ltd.**, in respect of services rendered in the preparation of this report.

DATED at Calgary, Alberta, this 6th day of November, A.D. 1989.

Respectfully submitted,

C. H. Aussant, B.Sc., P.Geol., F.GAC

CERTIFICATE - D. G. DuPré

I, David G. DuPré, of 56 Parkgrove Crescent in the Municipality of Delta in the Province of British Columbia, do hereby certify that:

1. I am a Consulting Geologist with the firm of Keewatin Engineering Inc. with offices at Suite 800, 900 West Hastings Street, Vancouver, B.C.

2. I am a graduate of the University of Calgary, B.Sc. Geology (1969), and I have practised my profession continuously since graduation.

3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta; and I am a Fellow of the Geological Association of Canada.

4. I am co-author of the report entitled "Geological, Prospecting, and Geochemical Report on the **Deb South Property**, DEB 3 and 4 Mineral Claims, Skeena Mining Division, British Columbia", dated November 6, 1989.

5. I do not expect to receive any interest (direct, indirect, or contingent) in the property described herein nor in the securities of **Ross Resources Ltd.**, in respect of services rendered in the preparation of this report.

DATED at Vancouver, British Columbia, this 6th day of November, A.D. 1989.

Respectfully submitted,

PROFESSIONAL GEOLOGIST DAVID DUPRE ALBERTA

David G. DuPré, P.Geol., FGAC

BIBLIOGRAPHY

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Northern Miner: - Nov.7, 1989

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---------- (1989): Summary Report on the Gold Boulder Property, Skeena Mining Division; for Ross Resources Ltd., private company report

---------- (1989): Summary Report on the Gold Unuk Property, Skeena Mining; for Ross Resources Ltd., private company report

A P P E N D I X

Summary of Personnel
Certificates of Analysis
Analytical Techniques

* *

SUMMARY OF PERSONNEL

Name / Address	Position	Dates	Man Days
C. H. Aussant Calgary, Alberta	Project Geologist	Sep.9-Oct.16	0.25
Don McLeod LaRonge, Sask.	Senior Prospector	Sep.9-Oct.16	1.50
Dennis McLeod Stanley Mission, Sask.	Junior Prospector	Sep.9-Oct.16	1.25
Irvine Roberts Stanley Mission, Sask.	Junior Prospector	Sep.9-Oct.16	1.50
C. Oevermann Smithers, B.C.	Cook	Sep.9-Oct.16	0.50
		TOTAL	5.00

Bondar-Clegg & Company Ltd.
130 Pemberton Ave.
North Vancouver, B.C.
V7P 2R5
(604) 985-0681 Telex 04-352667

Deb Soil

BONDAR-CLEGG

A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

Geochemical Lab Report

DATE PRINTED: 23-OCT-89

REPORT: V89-06999.0 | PROJECT: UNUK | PAGE 2A

SAMPLE NUMBER	ELEMENT UNITS	Au PPB	Ag PPM	As PPM	Ba PPM	Be PPM	Bi PPM	Cd PPM	Ce PPM	Co PPM	Cr PPM	Cu PPM
T1 89KZ-L 29	0-5 S/N	<5	0.2	12	60	<0.5	5	<1	22	6	7	10

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PROJECT: UNUK

SAMPLE NUMBER	ELEMENT UNITS	Ga PPM	La PPM	Li PPM	Mo PPM	Nb PPM	Ni PPM	Pb PPM	Rb PPM	Sb PPM	Sc PPM	Sn PPM
J1 89KZ-L 29		8	11	6	6	3	8	6	<20	6	2	<20

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DATE PRINTED: 23-OCT-89

REPORT: V89-06999.0

PROJECT: UNUK

SAMPLE NUMBER	ELEMENT UNITS	Sr PPM	Ta PPM	Te PPM	V PPM	W PPM	Y PPM	Zn PPM	Zr PPM
T1 89KZ-L 29		25	<10	<10	47	<10	5	51	7

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Geochemical Lab Report

A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

REPORT: V89-06781.0 (COMPLETE)

REFERENCE INFO:

CLIENT: KEEWATIN ENGINEERING INC.
PROJECT: PARADIGM

SUBMITTED BY: TERRAMIN RES. LAB
DATE PRINTED: 4-OCT-89

ORDER		ELEMENT	NUMBER OF ANALYSES	LOWER DETECTION LIMIT	EXTRACTION	METHOD
1	Au	Gold Fire Assay	93	5 PPB	FIRE-ASSAY	Fire Assay AA
2	Ag	Silver	93	0.2 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
3	As	Arsenic	93	5 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
4	Ba	Barium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
5	Be	Beryllium	93	0.5 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
6	Bi	Bismuth	93	2 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
7	Cd	Cadmium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
8	Ce	Cerium	93	5 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
9	Co	Cobalt	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
10	Cr	Chromium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
11	Cu	Copper	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
12	Ga	Gallium	93	2 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
13	La	Lanthanum	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
14	Li	Lithium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
15	Mo	Molybdenum	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
16	Nb	Niobium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
17	Ni	Nickel	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
18	Pb	Lead	93	2 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
19	Rb	Rubidium	93	20 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
20	Sb	Antimony	93	5 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
21	Sc	Scandium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
22	Sn	Tin	93	20 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
23	Sr	Strontium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
24	Ta	Tantalum	93	10 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
25	Te	Tellurium	93	10 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
26	V	Vanadium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
27	W	Tungsten	93	10 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
28	Y	Yttrium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
29	Zn	Zinc	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma
30	Zr	Zirconium	93	1 PPM	HNO3-HCL HOT EXTR	Ind. Coupled Plasma

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CLIENT: KEEWATIN ENGINEERING INC.
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SUBMITTED BY: TERRAMIN RES. LAB
DATE PRINTED: 4-OCT-89

SAMPLE TYPES	NUMBER	SIZE FRACTIONS	NUMBER	SAMPLE PREPARATIONS	NUMBER
T STREAM SEDIMENT,SILT	41	1 -80	41	DRY, SIEVE -80	41
R ROCK OR BED ROCK	52	2 -150	52	CRUSH,PULVERIZE -150	52

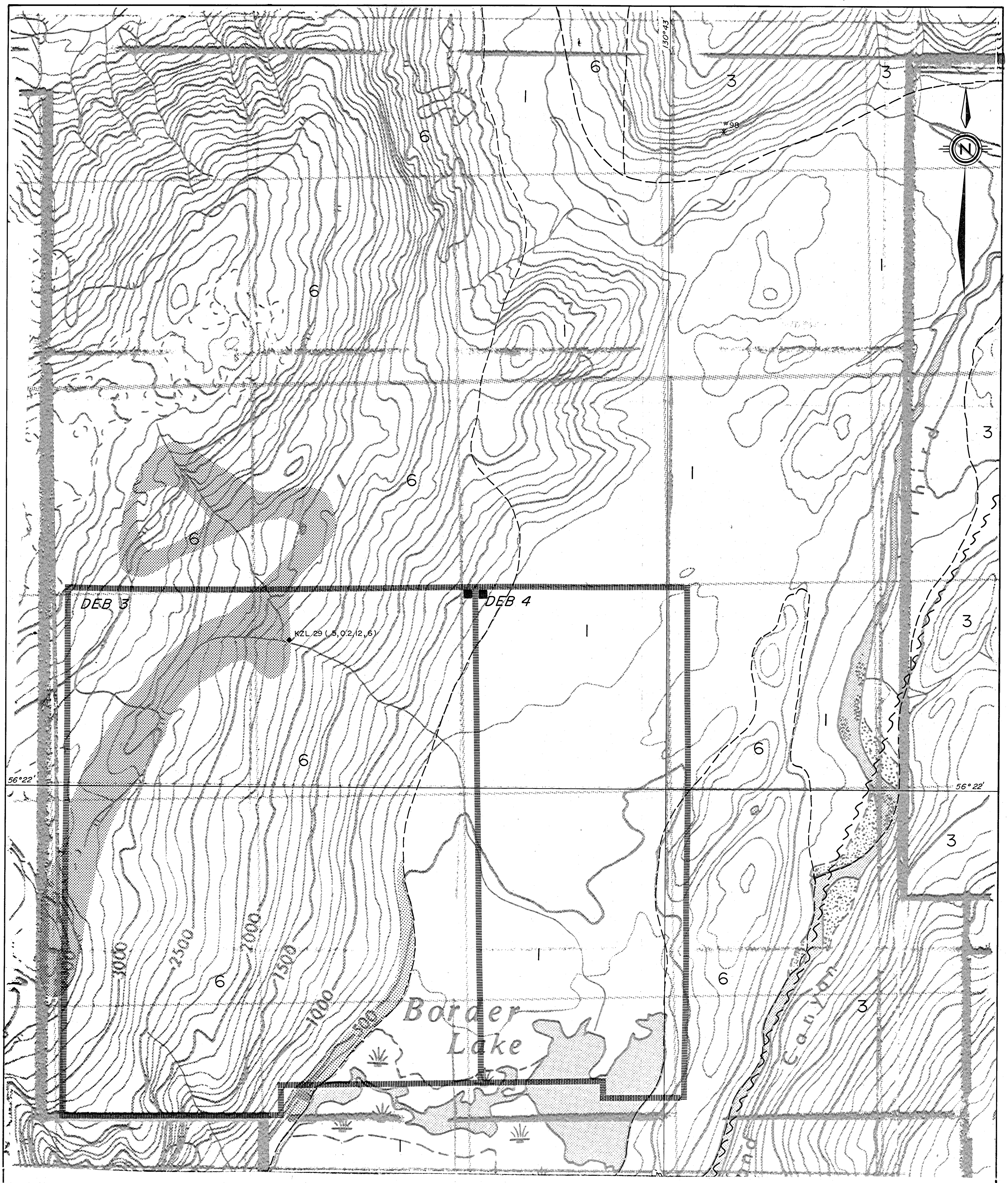
REPORT COPIES TO: KEEWATIN ENGINEERING INC.
TAIGA CONSULTANTS LTD.

INVOICE TO: KEEWATIN ENGINEERING INC.

SUMMARY OF EXPENDITURES

Deb 2 & 3

Personnel and Crew	$ 1,935.96
Transportation - helicopter/fixed wing/fuel	1,363.10
Camp - food/accommodation	363.23
Assay/Report/Drafting/Secretarial	1,032.27
TOTAL EXPENDITURES:	**$ 4,694.56**



LEGEND

Volcanic Sedimentary Rocks

Pleistocene to Recent

1 Basalt flows and tephra: dark brown to black, minor pillow lavas

Lower Jurassic (Pliensbachian to Toarcian)

2 Betty Creek Formation: pyroclastic-epiclastic sequence, heterogeneous, grey-green, massive to bedded, pyroclastics and sedimentary rocks (black, thinly bedded siltstone, shale, and argillite)

Upper Triassic to Lower Jurassic (Norian to Sinemurian)

3 Unuk River Formation: andesite sequence, green and grey, intermediate to mafic volcaniclastics and flows, with locally thick interbeds of fine-grained immature sediments, minor conglomerates, and limestone

Upper Triassic (Carnian to Norian)

4 Stuhini Group: brown, black, grey; mixed sedimentary rocks (siltstone, shale, argillite, limestone, chert), with minor mafic to intermediate volcanics and volcaniclastic rocks

Intrusive Rocks

Tertiary

5 Post-Tectonic Dykes

King Creek Dyke Swarm: feldspar porphyry dacite, andesite, diabase, and hornblende to quart diorite; limits of the unit shown indicate where the dykes exceed 50% of the exposed bedrock

9 Hawilson Monzonite - fine grained monzonite

6 Coast Plutonic Complex: hornblende-biotite-quartz diorite to granodiorite.

Jurassic

7 Unuk River Diorite Suite:
- a) Max: biotite-hornblende diorite, quartz diorite, granodiorite
- b) Melvelle: hornblende-biotite diorite, quartz diorite

Metamorphic Rocks

8 Metamorphic equivalents of Units 1, 2, or 3
- a) hornblende, mylonite gneiss, mylonite
- b) Unuk-Harrymel Fault Zone, strongly sheared rock within fault zone

SYMBOLS

- Geological contact (observed, assumed)
- Bedding with dip
- Foliation
- Regional anticline
- Fault (defined, assumed)
- Airphoto lineament
- Regional stream silt sample site (Au ppb, Ag ppm, As ppm Sb ppm)
- Minfile mineral occurrence (Cu ppm, Pb ppm, Zn ppm, Au ppb, Ag ppm)
- Rock sample - outcrop (Au ppb, Ag ppm, As ppm, Sb ppm)
- Rock sample - float (Au ppb, Ag ppm, As ppm, Sb ppm)
- Stream silt sample (Au ppb, Ag ppm, As ppm, Sb ppm)
- Heavy mineral sample (Au ppb, Ag ppm, As ppm, Sb ppm)
- Trench
- 1989 Prospecting Coverage

GEOLOGICAL BRANCH
ASSESSMENT REPORT

19,721

ROSS RESOURCES LTD.	
DEB SOUTH GEOLOGY & 1989 EXPLORATION SAMPLE LOCATIONS & RESULTS	
DATE: NOV. 1989	NTS: 104 B/7
PROJECT: DEB SOUTH	
SCALE: 1:10,000	0 100 200 300 400 500 METRES
KEEWATIN ENGINEERING INC.	MAP No. 1