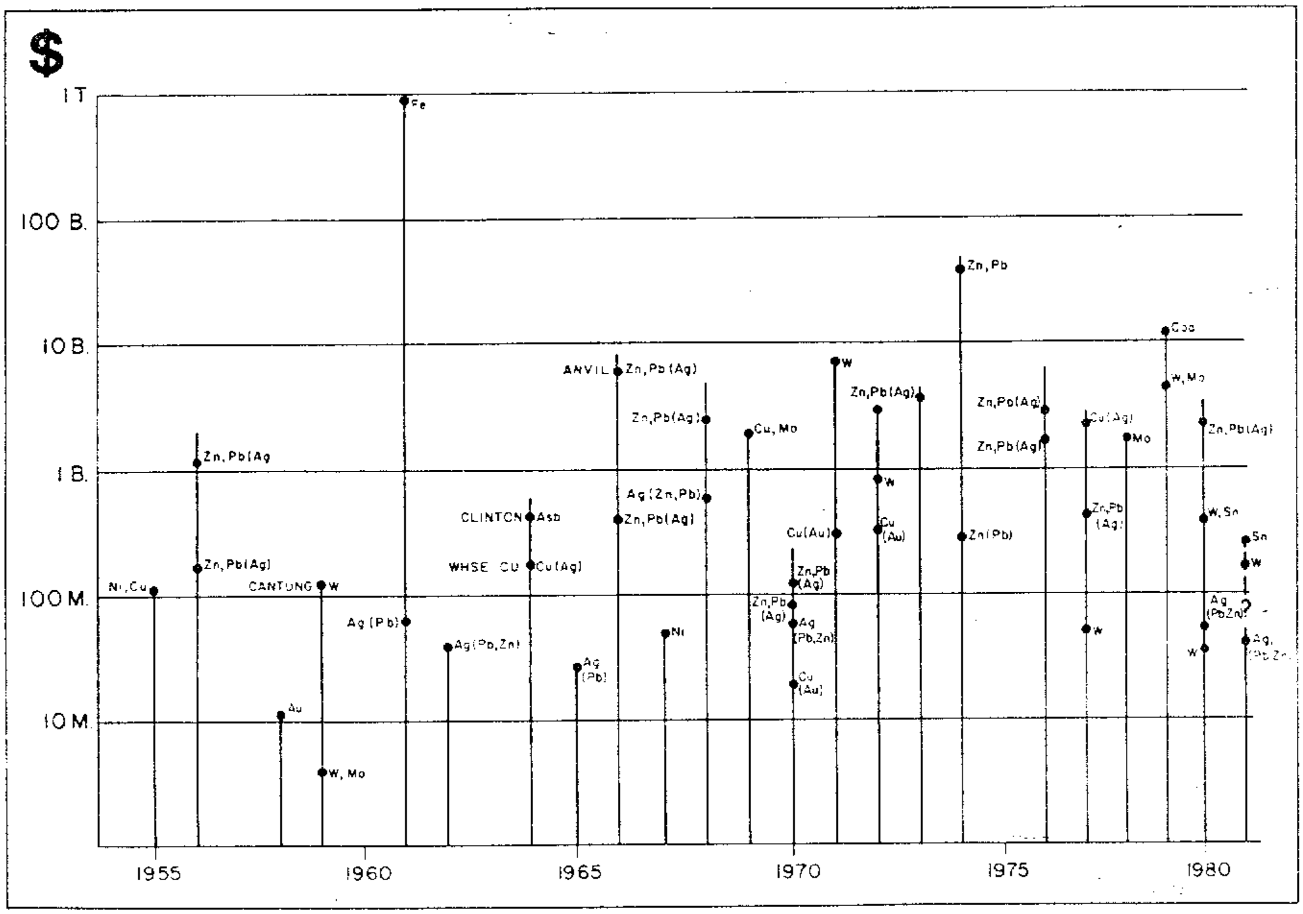
YUKON

EXPLORATION and GEOLOGY 1981



Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

Yukon EXPLORATION and GEOLOGY 1981

Exploration and Geological
Services Division
Department of Indian and
Northern Affairs
Whitehorse

Resumé

Trois mines ont opéré au Yukon en 1981. L'Union des Mines Keno Hill Ltd (United Keno Hill Mines Ltd) à Elsa productrice d' argent-plomb-zinc; Cyprus Anvil Mines Ltd à Faro produisant du plomb-zinc-argent, et l'opération miniére cuivre-or-argent de la Whitehorse Copper Mines à Whitehorse.

La valeur de la production miniére du Yukon a diminué de 2.4%, de $362.001.000 en 1980 à $35.266.000 en 1981. La quantité d'or et d'argent produit a augmenté considérablement en 1981 et fut reçu favorablement par des prix correspondant trés positif pour l'or, mais malheureusement trés négatif pour l'argent. La Production de plomb et de zinc tomba de 26% et 12% respectivement.

Les prix du plomb étaient en légère diminution par rapport à 1980; par contre les prix du zinc virent une nette augmentation. La production du cuivre tomba de 16% et les revenus correspondant, de 29%. La production de charbon augmenta de 11.634 tonnes en 1980, à 28.933 tonnes en 1981.

La production des placers d'or basé sur les payement des taxes de royauté, était de 3,110,000 gr (3,11 tonnes) en 1981 avec une valeur brute de $55 million. La contribution du rendement minier du Yukon par l'industrie des placers, a augmenté de 1.5% en 1978 a 10% en 1980 et 15.6% en 1981.

Le nombre des concessions de quartz piqueté en 1982 fut de 10,653, presque égal à la quantité de 10,892 pour 1980. Les dépenses d'exploration ont légèrement augmenté de $36 millions en 1980, à $38.9 millions en 1981, avec une augmentation de $1.6 millions dépensé durant 1981 dans l'exploration du charbon.

Les étapes les plus avancées de l'exploitation et de la mise en valeur ont compté pour la plus grande partie des 40 millions de dollars qui, selon les estimations, ont été dépensés pour l'exploitation miniére au Yukon en 1981. Les produits qui ont accaparé la plus grande partie des montants dépensés sont le plomb-zinc (argent) et le tungsténe. Les gisements de plomb-zinc (argent) ont donné naissance à d'intenses activités de forage dans la région de la ceinture Anvil, dans la région du col Macmillan et dans la région du lac Clear tandis que le gisement TOM et le col Howard étaient le théâtre d'activités de mise en valeur souterraine. La Cyprus Anvil a apporté des modifications importantes à son usine, à ses installations de résidus et à sa centrale électrique. Le tungsténe a connu une trés bonne année. Les travaux supplémentaires réalises par la Canada Tungsten sur le gisement du ravin Ray ont augmenté considérablement ses possibilités de mise en exploitation. On procède actuellement aux premières étapes de l'analyse de faisabilite pour le gisement Logtung de Amax et l'on achève celle relative au gisement Mactung. Sur la propriété Kalzas de la Union Carbide située au sud de Mayo, on a découvert une minéralisation de quartz-wolframite d'un type intéressant et nouveau dans cette région de la Cordillère. La Whitehorse Copper a poursuivi ses recherches en vue de découvrir d'autres amas de skarns de Cu-Au-Ag qui lui permettraient de poursuivre l'exploitation commencée il y a un an et demi.

On a fait des recherches intenses en vue de découvrir des métaux précieux au centre et à l'ouest du Yukon, notamment dans les régions de Keno Hill, du chaînon Wheaton et de la rivière Rackla. La Longue grève des employés de la United Keno Hill à Elsa s'est traduite par une perte de huit mois et demi de production. L'ouverture de sa mine d'or-argent Venus qui était prévue pour le mois d'août 1981 a été reportée à plus tard en attendant la reprise des prix des métaux précieux. En poursuivant ses activités de mise en valeur souterraine, la Prism Resources a réussi à augmenter les réserves de son gisement d'argent Vera au nord de Mayo. La teneur potentielle en métaux précieux de skarns pousse les compagnies à songer de plus en plus à en faire l'exploitation.

En 1981, le molybdène n'a pas connu une année très prospère. La compagnie Amoco a continué à reboucher les trous de forage des monts Red Tandis qu'au nord-ouest de Dawson, les compagnies Cominco et Getty se sont rendues compte que les gisements de molybdène-cuivre porphyrique Pluto étaient importants mais de faible teneur. On a continué à exploiter l'étain dans les régions de Mayo et de Rancheria sans toutefois obtenir des résultats très encourageants. L'exploitation d'uranium dans les montagnes Wernecke a connu un sort à peu près semblable.

L'exploitation des placers a connu une bonne année en 1981 mais on s'attend à ce que la diminution des prix de l'or et l'augmentation des taux d'intérêt se fassent avec acuité dans ce secteur.

CONTENTS

YUKON EXPLORATION AND GEOLOGY, 1981

Introduction

This volume contains reports by geologists of the Department of Indian and Northern Affairs on the geology of Yukon mineral deposits and mineral districts under active investigation. Much of the reports are summaries of work done in Yukon during 1981 by mineral exploration companies. Some work done in 1979 and 1980 that was not previously documented is also included. This volume follows earlier annual Mineral Industry Reports for Yukon published by the Department of Indian and Northern Affairs and by the Geological Survey of Canada.

The geological reports present the results of field work done during 1981. The aim of these reports is to provide authoritative descriptions of the geology of mineral showings or districts based on first-hand field study. Most of these studies focus on areas of current economic interest, but some concern districts or deposits where geological problems require study. Reports are by geologists on the Department's staff, D.I.A.N.D. summer employees and also general geological studies in Yukon that were not supported by D.I.A.N.D. but for which this volume is a suitable publication vehicle. The geological reports are grouped in the first part of this volume and are ordered alphabetically by author.

Summaries of exploration work are grouped in the second part of this volume. They are based on reports submitted to the department for assessment credits by exploration companies. Some of these are amplified by replies to questionnaires sent to exploration companies by the Geology Section and by responses to enquiries of the staff. Each summary has been edited and approved for publication by the company that filed the work. The emphasis in the summaries is on the nature and the results of work done. References to published descriptions of the geology are included. For new showings, where no description is published, a summary based on regional data is given.

The reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. The key also gives the most recent literature reference describing the occurrence. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1981 are distinguished from those located earlier to emphasize areas that will focus future exploration. The claim information derives from the maps of the Supervising Mining Recorder, D.I.A.N.D., Whitehorse. Finally, the maps indicate secondary access roads and winter tote trails.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus, each map precedes a section describing exploration activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

The geological, geochemical and geophysical reports accepted for credit as assessment work by the Department of Indian and Northern Affairs may be of interest to exploration geologists. An index to mining assessment reports, including those that are confidential and those available for inspection, is available from the department. Assessment reports are released for public inspection six months after the claims (on which the work was carried out) have lapsed.

The Geology Section

The Geology office sells topographic, geological, aeronautical, and land-use maps, as well as Geological Survey of Canada publications, covering Yukon and adjacent parts of B.C., and the N.W.T. A library of G.S.C., B.C. Dept. of Mines, Alaska Bureau of Mines, U.S.G.S. Alaska publications, and geological texts and journals is available for consultation. Open file reports of the Geological Survey of Canada that concern Yukon are available for viewing. Air photos, covering Yukon from latitude 60° to 65°N, are available for use in the office as is the latest catalogue of Yukon air photos from the National Air Photo Library. A current list of good prints of the 1972-1977 satellite (LANDSAT) imagery of the Yukon is included in the Air Photo catalogue. The office also has a LANDSAT mosaic of the Cordillera on display and a collection of colour LANDSAT photos of the Yukon.

The H.S. Bostock Core Library, across the street from the Geology Office, contains drill core from Yukon mining properties. Some core is available for inspection and some is confidential. The core library contains working quarters equipped with diamond saws, a core splitter, a vibrating polisher, rock staining facilities and fume hood. A petrographic microscope with capability for transmitted and reflected light, and a binocular microscope are also situated in the core library. The Geology Office presently has the following technical equipment: McPhar Spectra 44 (four channel) gamma-ray spectometer, ultraviolet lamps and two GR -101A scintillometers. The equipment and instruments are available for use by industry personnel by arrangement with the core librarian. We have a Spillsbury and Tindall SBX-121 Radiotelephone base station installed in our office to allow radio contact on 4441 MHz during business hours in the summer season.

The Geology Section staff includes five geologists, an office manager, core librarian and a secretary. Major staff changes have taken place since the last volume was prepared. Dirk Tempelman-Kluit returned to the Geological Survey of Canada at the end of 1981, after a two-year secondement to D.I.A.N.D. as Regional Geologist. Jim Morin started his new position as Chief Geologist, Regional Manager in January, 1982. Ruth Debicki resigned from her position as staff geologist in January, 1982. Two staff geologists, Pat Watson and Kate Grapes, were appointed in January, 1982. Steve Morison joined the Section in April, 1982 as geologist responsible for placer, industrial and energy minerals.

Various activities were undertaken by the Geology Section staff in 1981.

Dirk Tempelman-Kluit was heavily involved in the summer season with preparation of the 1979-80 Report. In addition, he visited several properties including the LILYPAD (FROG), ACE (ONE HUMP), LADY DI and placer workings on Bonanza Creek. The placer investigation was especially interesting because it fueled ideas towards a hypothesis invoking groundwater as the main transportation and depositional agent for gold in the Bonanza Creek area. Dirk was awarded the Past President's Medal of the Geological Association of Canada in the spring and he followed this up in the fall with a cross-Canada speaking tour about the origin of the northern Cordilleran orogen.

Grant Abbott continued field work in the Macmillan Pass area, producing a geological map and report, both for this volume and also as a separate open file. He plans to finish this project with one more summer's fieldwork in 1982.

Ruth Debicki conducted field work in the placer districts, compiling information that will ultimately be published in a Placer Mining Industry Report covering 1978 to 1982. During the year, one of her major projects involved amassing information from numerous sources and writing a report entitled Yukon Mineral Industry 1941-1959 that was published in April, 1982.

Jim Morin continued his investigation of precious metal occurrences and started a reconnaissance study of continental volcanic rocks in the Yukon Crystalline Terrane.

Pam Reid, a Ph.D. candidate at the University of Miami, completed the second summer of a three - year study of the Upper Triassic carbonate buildups in southeast Laberge map-area under contract to D.I.A.N.D. Grant Lowey, a Ph.D. student at University of Calgary, completed the first summer of a two-year study on early Cenozoic conglomerates in the Sixty Mile River area west of Dawson. Studies were conducted by two undergraduate students, Emond and Smith, from the University of Ottawa who were employed by D.I.A.N.D. during the summer and whose studies formed the basis for their B.Sc. theses. Diane Emond conducted a placer evaluation sampling program along Highet Creek in the Mayo area, and Monica Smith mapped and sampled intrusive rhyolite plugs of probable early Cenozoic age in the Wheaton River area southwest of Whitehorse.

Geology Section: back - Frank Gish, Steve Morison, Pat Watson and Virginia Klaver; middle - Grant Abbott, Dirk Tempelman-Kluit; front - Kate Grapes, Jim Morin and Julie Broeren.

Few reports by non-D.I.A.N.D. supported authors are included in this volume, though papers by them on economic geology of Yukon are welcome. One of these is a report by Paul Barrette, University of Ottawa, who completed a B.Sc. thesis on contact metamorphosed calcareous argillite in the Mike Lake area east of Dawson. His fieldwork was supported by Anaconda Canada Exploration Ltd. Jill Kirker, M.Sc. student at University of Calgary, wrote a report based on her M.Sc. thesis concerning fluid inclusions and lead isotopes of the Rusty Springs silver-base metal quartz veins north of Dawson. Her fieldwork was sponsored by Rio Alto Exploration Ltd.

ACKNOWLEDGEMENTS

Preparation of this volume has required the efforts of quite a few people in addition to the authors of the individual papers. Jim Morin organized and coordinated preparation of the report by managing a competent crew. Foremost are our two staff geologists. Pat Watson wrote assessment report summaries for the Whitehorse and Watson Lake Mining Districts and oversaw the accumulation of data entered into the report. Kate Grapes wrote the summaries for the Dawson and Mayo Mining Districts and prepared the maps and lists showing claim dispositions and mineral occurrences. All written material was processed through 'The Word Pro', an apt title for Jane Gaffin who deciphered our written manuscripts and is responsible for the quality of this text.

The Drafting Section of D.I.A.N.D., Whitehorse devoted a large part of spring 1982 to preparing figures for Geology Section. They are a valuable, competent and appreciated support group without whom this volume would look quite bare.

The terminal stages of manuscript preparation are tedious and were much lightened by assistance of our summer students: Craig Hart, Greg Lynch, Susan Acorn and Marion Craig. Lastly, when the laid out manuscript leaves Geology's hands, it goes under the responsible tutelage of Patti Smillie into our Public Affairs Section and then to the publisher.

Drafting Section: left to right, Bob Lewis, Denese Beaudion, Laurie Butterworth and Ian Stallabrass.

AN OVERVIEW
OF YUKON MINERAL INDUSTRY, 1981

J.A.Morin and R.L.Debicki
Geology Section
DIAND, Whitehorse

SUMMARY

Advanced stages of exploration and development accounted for much of the $40 million spent in Yukon on mineral exploration in 1981. Commodity wise, the bulk of the money was directed towards lead-zinc (silver) and tungsten. Lead-zinc (silver) deposits were the object of much drilling in the Anvil belt, the Macmillan Pass area and the Clear Lake area while underground development proceeded at TOM and at Howard's Pass. Cyprus Anvil effected substantial modifications in their mill, tailings facilities and power source. Tungsten has seen a favourable year. Additional work on the Ray Gulch deposit of Canada Tungsten has increased the likelihood of its ultimate exploitation. The Logtung deposit of Amax is at the preliminary stages of feasibility analysis whereas its Mactung deposit is at the end stages. An interesting style of quartz-wolframite mineralization, new for this area of the Cordillera, was discovered on Union Carbide's Kalzas property south of Mayo. Whitehorse Copper pursued their search for additional Cu-Au-Ag skarn bodies needed to extend the mine's life from the presently forecast December, 1982 shutdown.

Precious metals were actively sought in central and western Yukon, notably in the Keno Hill, Dawson Range, Wheaton River and Rackla River areas. At Elsa, a lengthy strike against United Keno Hill Mines resulted in a loss of about 8-1/2 months' production. Their Venus gold-silver mine, scheduled to open in August, 1981, was put back on the shelf to await improved precious metal prices. Continued underground development allowed Prism Resources to expand reserves in their Vera silver deposit north of Mayo. Potential precious metal content in skarns is causing them to be looked at more and more as exploration targets.

Molybdenum was generally low profiled this year. Amoco continued plugging holes into Red Mountain, while northwest of Dawson, Cominco and Getty showed the Pluto porphyry copper-molybdenum prospect to be large but low grade. Tin exploration continued in the Mayo and Rancheria areas but was not much encouraged by results, as was also uranium exploration in the Wernecke Mountains.

Again, placer mining was active in 1981, but lower gold prices and increased interest rates are expected to take their toll in 1982.

INTRODUCTION

The value of mineral production in Yukon decreased 2.4% from $362,001,000 in 1980 to $353,266,000 in 1981 (see Table I, Figures 1a,b). The amount of gold and silver produced increased dramatically in 1981 and was received by correspondingly positive prices for gold but strongly negative prices for silver. Both lead and zinc production were down, 26% and 12% respectively. Lead prices were down slightly from 1980 whereas zinc prices were substantially higher. Copper production was down 16% and revenue a corresponding 29%. Coal production increased from 11,634 tonnes in 1980 to 28,933 tonnes in 1981.

Placer gold production based on royalty returns was 3,110,000 g in 1981 with a gross value of $55 million. The contribution to Yukon's mineral output by the placer industry was increased from 1.5% in 1978 to 10% in 1980 and 15.6% in 1981.

The number of quartz claims staked in 1981 was 10,653, almost equal to the 1980 figure of 10,892 (see Figures 2, 3 and 4). Expenditures on exploration were slightly increased from $36 million in 1980 to $38.9 million in 1981, with an additional $1.6 million spent in coal exploration during 1981 (see Figure 5, Table II).

OPERATING MINES

Three mines operated in Yukon in 1981. They were the silver-lead-zinc producing operations of United Keno Hill Mines Ltd. at Elsa, the lead-zinc-silver producing mine of Cyprus Anvil Mines Ltd. at Faro and the copper-gold-silver production of Whitehorse Copper Mines at Whitehorse.

Surface exploration work at the United Keno Hill Mines Ltd. Elsa operations was cut back two months due to a strike. In their grid rotary percussion drilling program, 230 holes totalling 11,724 m tested eight target areas. Three targets returned ore grade values and will be explored and developed by underground and open pit mining. Six diamond drill holes totalling 1,023 m tested three target areas, but no ore intersections were encountered. In addition, 313,725 cu. m of overburden were moved as eight potential open pit targets were tested for a final evaluation of rotary percussion drill-tested veins. Three of the targets are reported as open pit mineable deposits.

At the Faro Mine of Cyprus Anvil, modifications to the concentrator began in 1980 and were completed in late 1981. These included addition of three grinding mills, replacement of all rougher and scavenger flotation cells by larger volume units and upgrading of the concentrate dewatering and drying section. The lower than normal mill tonnages reflect difficulties experienced in milling zone II which was completed by mid-summer and in operating the concentrator during 10 months of the year while undertaking major modifications to the milling circuit. A major expansion to the tailings facilities was completed and additional power generating capacity in Faro was installed in conjunction with N.C.P.C. A total of 24 diamond drill holes for 13,720 m were drilled: 3 on DY, 3 on GRUM, 11 on FARO and 6 exploration holes. Work continued on long range planning for the development of the VANGORDA, GRUM, and to a lesser extent, the DY, but no firm decisions have been reached.

Forty-eight diamond drill holes totalling 7,454 m were drilled in the Whitehorse Copper Belt this year. At Cowley Park, the South Zone reserves were increased to 213,636 tonnes grading 2.46% Cu and 0.14% MoS_2. However, the zone is currently considered to be uneconomic. At North Star, 1.6 km south of the Little Chief Mine, drilling continued into November. Nine holes were drilled, the best intersections at depths from 427 m to 518 m: 14.6 m of 5.05% Cu, 14.3 m of 1.53% Cu and 10.1 m of 1.52% Cu. The high-grade intersection is in garnet diopside skarn and is not correlative to the other intersections. Approximately 24 line km of pulse EM survey using a Geonics EM 37 unit were completed in the North Star area and 1,280 line km of airborne magneto-

TABLE I

MINERAL PRODUCTION, YUKON TERRITORY

	1978*	1979*	1980*	1981*
Gold (lode)	$ 7,354,000	5,835,000	19,200,000	53,964,000
grams	1,026,000	523,353	908,550	3,046,000
Gold** (placer)	$ 4,167,000	8,819,000	34,799,000	55,093,400
grams*	581,346	790,949	1,646,717	3,110,000
Silver	$ 29,405,000	47,713,000	108,725,000	69,528,000
grams	148,000,000	125,172,604	137,565,148	172,000,000
Lead	$ 65,466,000	104,625,000	76,636,000	50,706,000
kg	80,643,000	79,744,650	70,154,178	51,651,000
Zinc	$ 75,481,000	115,989,000	94,137,000	103,783,000
kg	98,506,000	120,291,108	97,935,887	86,486,000
Cadmium	$ 590	---	---	---
kg	96	---	---	---
Copper	$ 18,066,000	18,670,000	28,504,000	20,192,000
kg	11,012,000	7,931,060	10,879,636	9,129,000
Asbestos	$ 32,404,000	Clinton Creek	---	---
tonnes	63,000	Mine Closed	---	---
Coal tonnes	26,000	25,356	11,634	28,933.4
Gross Value (excludes coal)	$232,343,590	301,651,000	362,001,000	353,266,000

*dollar values determined using average metal price during year, according to Canadian Mining Journal figures.

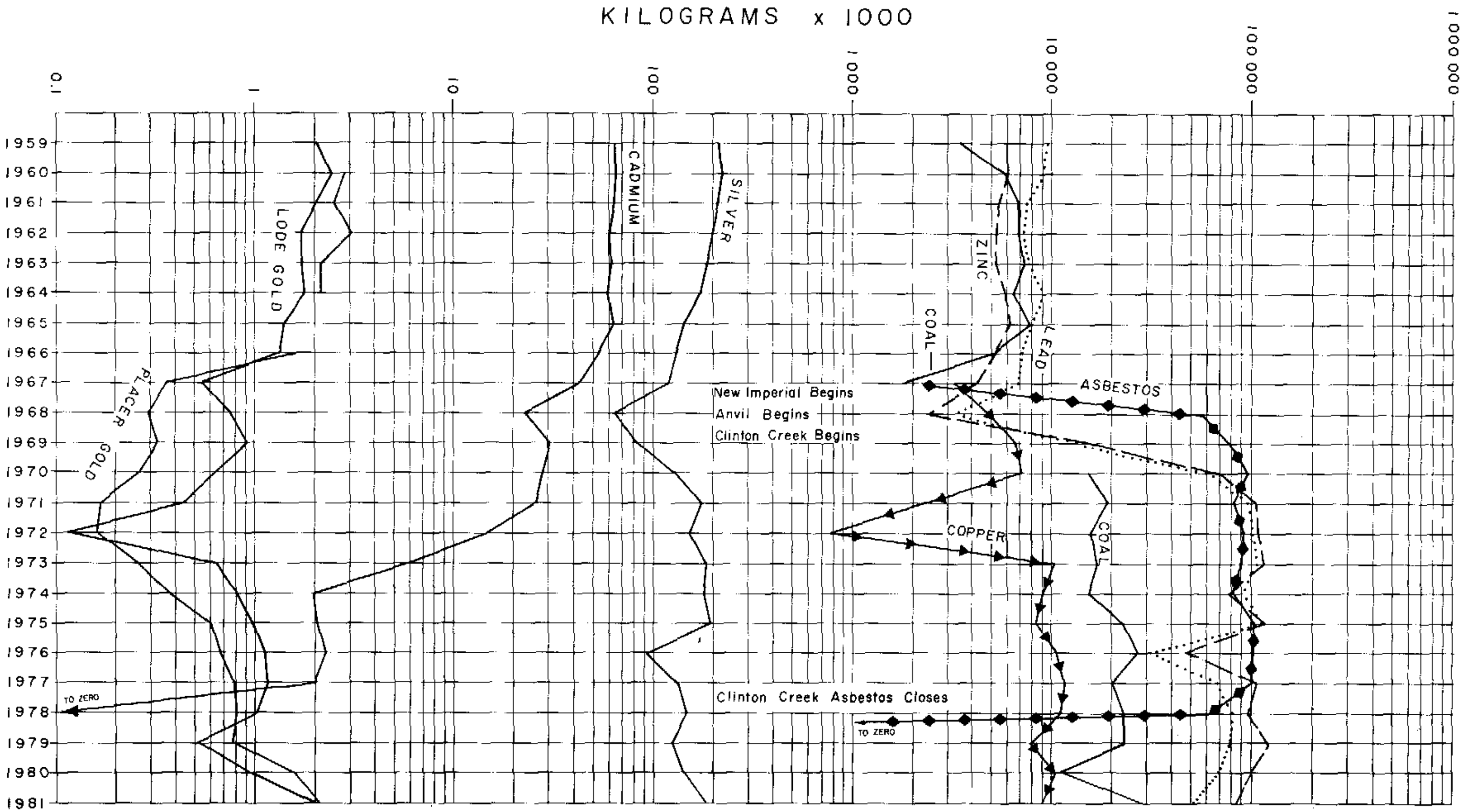
**placer gold production based on royalty paid on crude gold, adjusted to reflect fine gold content.

TABLE II

DIAMOND DRILL REPORTS SUBMITTED FOR ASSESSMENT CREDIT

Mining	1978		1979		1980		1981	
District	holes	metres	holes	metres	holes	metres	holes	metres
Dawson	0	0	3	1,204	15	1,629	1	141
Mayo	77	6,329	20	2,830	310	29,899	84*	19,201
Watson Lake	*	10,816	28	6,380	102	14,700	69*	21,006
Whitehorse	73	8,932	58	14,278	93	17,618	53*	8,123
Total	--	26,077	109	24,692	520	65,432	207*	48,471

* Total number of holes not given in records



KILOGRAMS x 1000
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10 000
100 000
1 000 000
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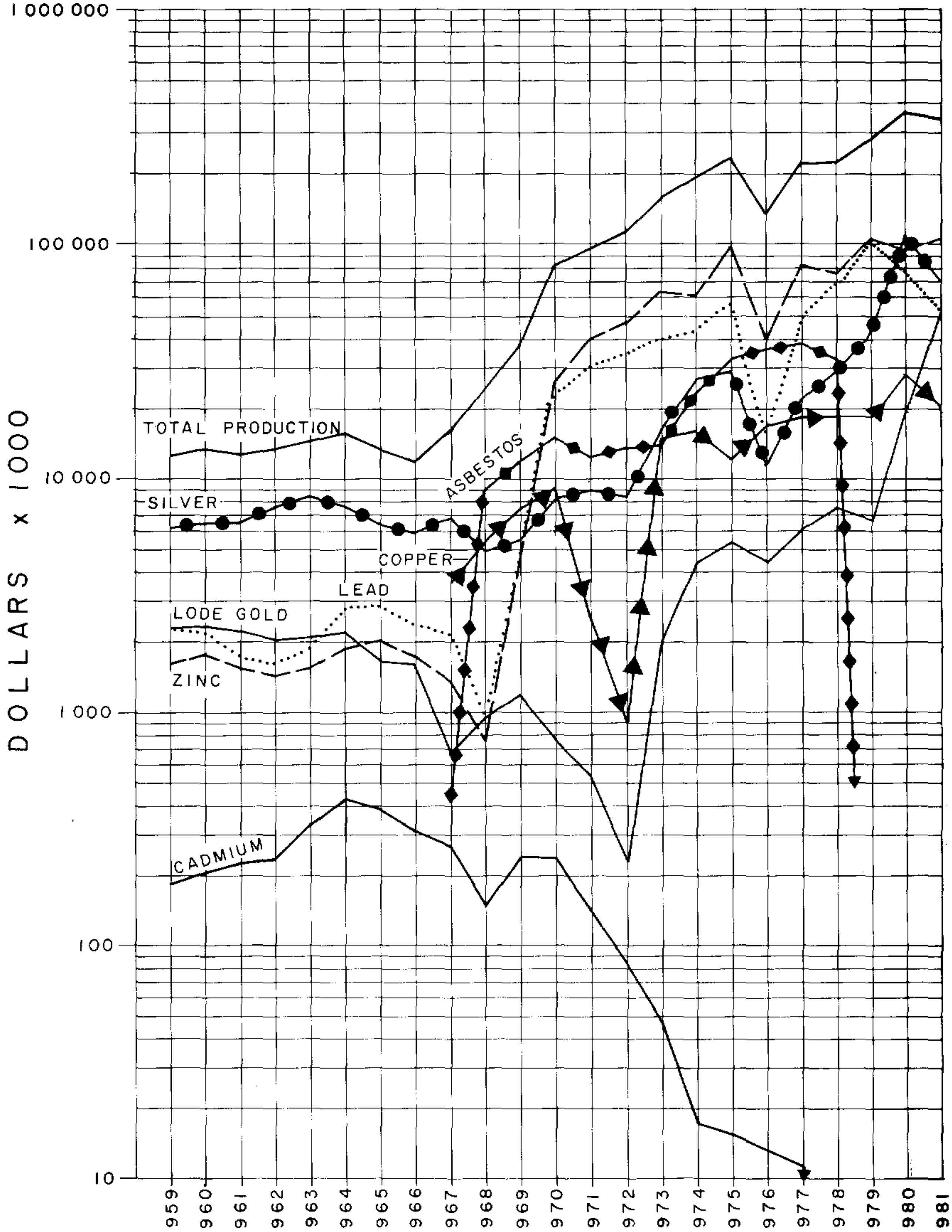
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
LODE GOLD
PLACER GOLD
CADMIUM
SILVER
ZINC
COAL
LEAD
ASBESTOS
COPPER
COAL
New Imperial Begins
Anvil Begins
Clinton Creek Begins
Clinton Creek Asbestos Closes
TO ZERO
TO ZERO



DOLLARS x 1000
1 000 000
100 000
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1 000
100
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TOTAL PRODUCTION
ASBESTOS
SILVER
COPPER
LEAD
LODE GOLD
ZINC
CADMIUM
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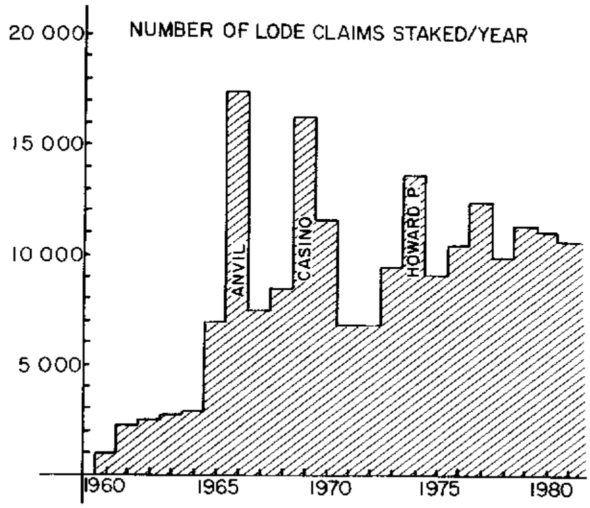

Figure 2

New lode claims staked annually in Yukon between 1960 and 1981.

meter and EM surveys were flown over the Copperbelt.

The Venus Mine of United Keno Hill Mines Ltd. (U.K.H.M.) is now in limbo awaiting improved precious metal prices. The cost of putting the mine into production has grown to $9.2 million from an original estimate of $7 million. It was expected to produce approximately 680 g Au and 20,525 g Ag per day from 91 tonnes of ore. A gold-silver vein that dips gently westward into the hillside of Montana Mountain, it had formerly been worked in the early 1900's and more recently in the late 1960's. Underground workings inherited by U.K.H.M. were in very good shape and by mid-August, 1981, the mine services and rehabilitation were completed and mining commenced in three stopes and one slot raise at that time. By the beginning of October, 1981, a small tonnage of ore had been removed from the mine and stockpiled at the millsite. The mill is located in British Columbia, 10 km south of the mine, and had numerous start-up problems.

LEAD-ZINC (SILVER)

The lead-zinc stores of the Selwyn Basin were further investigated with varying degrees of success. In the northwest part of the Basin, property work was conducted by Anaconda on their STYX and ACE claim groups. Thirty-five km north of Dawson City, the STYX ground covers metal-rich shales of Lower to Upper Paleozoic age. A shale-hosted target was tested by four diamond drill holes totalling 350 m in length. The ACE, a Pb-Zn-Ag skarn in the Earn Group on Dromedary Mountain, underwent continued work this year consisting of 11 diamond drill holes totalling about 1,000 m. The intriguing shale-hosted massive sulphide-barite deposit at Clear Lake northwest of Faro was the object of continued investigation by the Macmillan Joint Venture of Getty Mines Ltd. and Essex Minerals. Some drill intersections of the stratiform pyrite, pyrrhotite, galena, sphalerite and barite mineralization are over 100 m long. Prospecting, geological mapping, ground EM (MAX-MIN II) and diamond drilling (1,799 m) programs were conducted. In the nearby area, 50 km to the east,

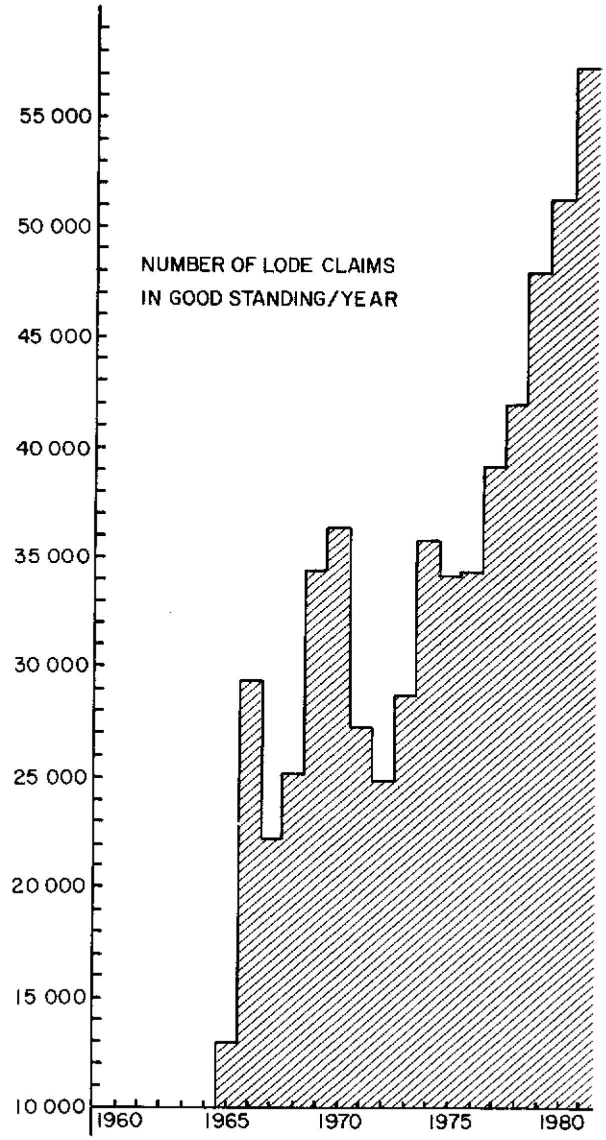

Figure 3

Yukon lode claims in good standing between 1960 and 1981.

Welcome North/Esperanza discovered Pb-Zn mineralization in Devono-Mississippian rocks and staked the LADY DI claims.

The Faro-Ross River area in central Selwyn Basin was the site of much property evaluation work. Working on ground optioned from Welcome North, Getty Mines conducted geological mapping, soil geochemical sampling and an airborne EM survey in the Vangorda area over the EVA, ALICE and MABEL claims. They conducted the above work and also detailed gravity surveys over the RACHEL, MN and CIVI claims. Also on ground optioned from Welcome North, Cyprus Anvil did 1,067 m of diamond drilling (3 holes) in the Tenas Creek area on the TENAS, MEL, BAR property in their continuing search for massive sulphides in Anvil stratigraphy.

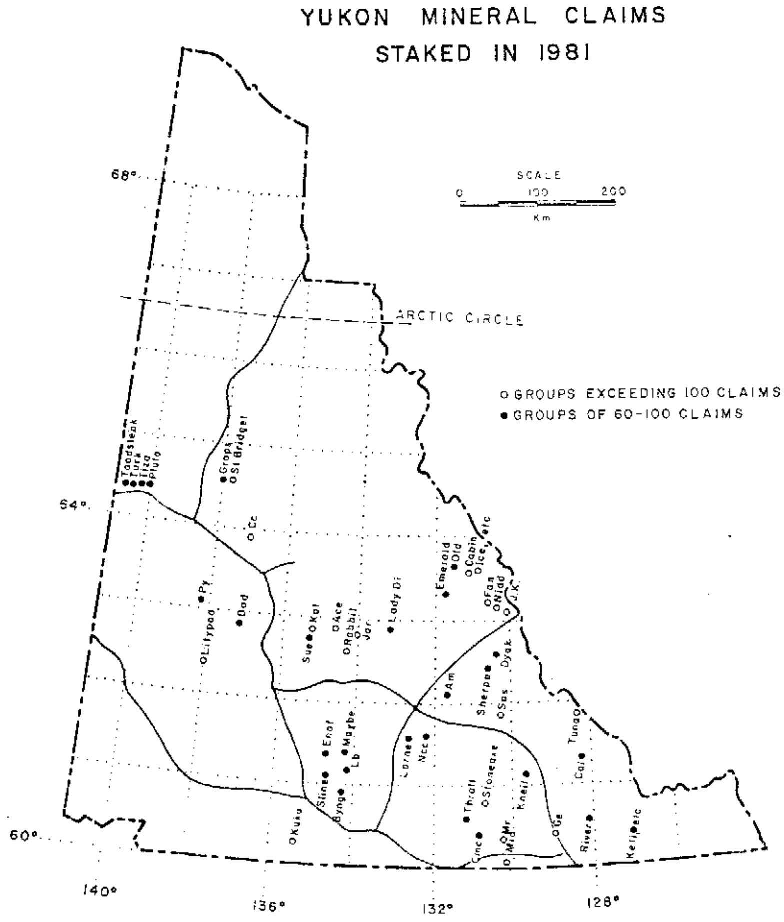

Figure 4

Main Yukon minerals claims staked in 1981.

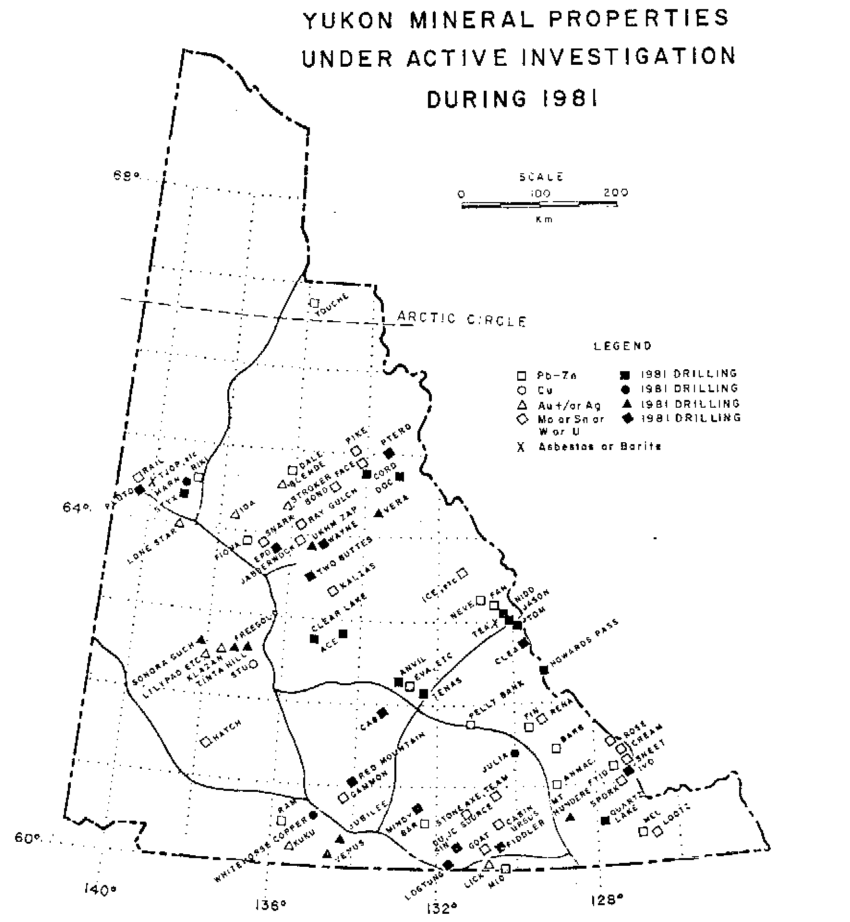

Figure 5

Main Yukon mineral properties under active investigation during 1981.

In the Pelly Banks area, Hudson Bay Exploration and Development worked on ground optioned from the Pelly Bank Syndicate. Underlying the area are calcareous and noncalcareous phyllites intercalated with graphitic units. Seven diamond drill holes were drilled for a total of 685 m and EM surveys were conducted to further check out previously determined anomalies.

An "all systems go" mentality persisted on the JASON property at Macmillan Pass where several drills were kept busy drilling 10,000 m. This continued feverish pace is no doubt related to the high-grade silver intersections earlier encountered in the stratiform, TOM-type deposit. The property is under joint ownership by Aberford Resources (formerly Pan Ocean), Mitsubishi and Ventures West. On the adjacent TOM deposit to the northeast, Hudson Bay Exploration and Development continued work on their decline which advanced 580 m with an 87 m descent. This work was conducted on the footwall side of the West Zone along with 343 m of additional underground drifting and a total of 690 m of underground diamond drilling. A problem which hampered progress this year was high water flow in the footwall chert pebble conglomerate. Besides underground development on their TOM deposit, Hudson Bay Exploration and Development staked four new groups of claims in the general area: SUN, FAL, BAR and SIM. Also in the Macmillan Pass area, Canadian Nickel did reconnaissance soil geochemical sampling on their DUO claims. Cominco continued working on their NIDD claim group on the north side of JASON. Near the boundary with the JASON claim group, soil geochemical sampling, EM, magnetic and gravity surveys, bulldozer and backhoe trenching, geological mapping and diamond drilling (5 holes-878 m) programs were unsuccessful in extending the mineralized "End" Zone from JASON onto the NIDD. Reconnaissance geological mapping and soil - stream sediment geochemical sampling were carried out over other parts of the property. AGIP conducted a program of geological mapping on the NEVE claims to the northwest. Placer Development and Essex Minerals pursued underground development work in the shale-hosted stratiform Pb-Zn deposit at Howard's Pass. A total of 457 m of drifting and 256 m of crosscuts was advanced. The continuity of the higher grade whitish grey mudstone was tested from five underground diamond drill stations with 34 holes totalling 960 m.

Southeastern Yukon also witnessed a considerable lead-zinc search. On their large ground holdings in the Frances Lake area, Cyprus Anvil pursued their ANMAC regional project over a wide area using conventional geological mapping, geophysics and geochemistry.

To the east, the Quartz Lake deposit of Noranda and Asarco received a major program of work. Gravity and EM surveys and geological mapping were conducted as an adjunct to five diamond drill holes totalling 610 m in depth. No new reserves were indicated by this work. The MEL property, 81 km northeast of Watson Lake, was the object of more work by St. Joseph Exploration (now Sulpetro Minerals Limited). Further testing of the southern extension of the barite-galena-sphalerite lens by IP and gravity survey methods reconfirmed earlier anomalies. In addition, they discovered a zinc showing about 5 km east of the main showing. On the east shore of Frances Lake, Cominco attempted to find an extension of the known zone of Pb-Zn-Ag mineralization on the BARB claims optioned from Sovereign Metals. A lens of massive galena-sphalerite mineralization is enclosed in and conformable with the foliation of Devono-Mississippian mudstones and siltstones that are intruded to the east by a granodiorite stock. A program of detailed geological mapping and soil, rock and stream sediment geochemical sampling was conducted.

Thirty-two km to the northwest, Cominco continued work on their FIN claims where thin layers of laminated sulphides occur in black shale of Paleozoic age. Further to the drilling conducted lasted year, this year's program consisted of detailed geological mapping and soil and rock geochemical sampling.

Forty-five km northwest of Teslin, the BAR claims were worked on by Archer, Cathro and Associates for Chevron who optioned the property from DC Syndicate. A barite horizon with associated quartz, pyrite and galena occurs sandwiched between chert pebble conglomerate and chert of probable Devono-Mississippian age. Line cutting and geological mapping were conducted.

Working in shales of Helikian age 164 km northeast of Mayo, Rio Tinto drilled the stratiform sphalerite-galena showings on the CORD claims. Two diamond drill holes totalling about 300 m encountered low-grade lead-zinc intersections (less than 2% combined). The mineralization occurs in dolomitic siltstone in the basal facies of the Gillespie Lake Group and is markedly similar in style and stratigraphic position to the Hart River deposit, 140 km to the west.

Amax was involved with property work directed toward shale-hosted massive sulphide targets in several areas. In the Hess River area, they conducted geological and stratigraphic section mapping and a soil geochemical sampling program on the FAN claims. On the GREW claims, west of Ross River near Mt. Cook, they followed up geochemical anomalies with airborne magnetic and electromagnetic surveys, geological mapping and soil geochemical sampling. Their MIDWAY property is mainly in B.C. but extends into Yukon in the Rancheria area. Operating for Amax, Cordilleran Engineering conducted geological mapping, soil geochemical sampling and an airborne electromagnetic survey on the Yukon side and trenching and diamond drilling of four holes for a total of 854 m on the B.C. side. In the same general area, Amax and Pro Can Exploration worked on the WOLF claims optioned from Regional Resources Ltd. Four diamond drill holes totalling 579 m were drilled in search of shale-hosted massive sulphides.

North of Mayo in the Bonnet Plume River area, Amax tested the DOC claims on Mt. Profeit, where several pods of massive lead-zinc-silver mineralization are associated with a major fracture in Hadrynian dolomite. Five diamond drill holes totalling 686 m were drilled, but no significant intersections were encountered.

Northwest of Mayo near the Hart River, Mattagami conducted geological mapping and prospecting over their DALE and MELA claims. They are underlain by Helikian phyllite and Paleozoic carbonate that are separated by a major east-west trending fault. The only mineralization found consists of minor galena and chalcopyrite in thin quartz-calcite veinlets in phyllite.

Seventy four km northeast of Dawson, Mattagami conducted geological mapping, stream sediment geochemical sampling and a reconnaissance radiometric survey over the RIKI claims. The claims cover the contact of a Cretaceous syenite body with Jurassic schist and sedimentary rocks of the Road River Formation. Metals of interest are base metals and uranium but nothing significant was found. A few kilometres to the northwest, Mattagami also conducted geological mapping, property and stream sediment geochemical sampling on the TAK claims. The target was shale-hosted base metals but no mineralization was found. Mattagami also investigated a base metal skarn target in the Syenite Range, 82 km northwest of Mayo, on the FIONA claims. The claims cover the contact of Cretaceous syenite with Ordovician quartzite, conglomerate and intercalated limestone and were subjected to a program of geological mapping, prospecting and stream sediment geochemical sampling.

In the south Richardson Mountains, Mattagami worked on the TOUCHE claims which cover sphalerite mineralization associated with a fault cutting Paleozoic sandstones and shales. Geological mapping, soil geochemical sampling, prospecting and a VLF-EM survey were conducted.

The lead-zinc-silver skarn on the RAM claims near Primrose Lake was further evaluated by Canadian Nickel who conducted detailed geochemical soil sampling in the area of the showing.

In the Quiet Lake area, Canadian Occidental Petroleum staked the MOX claims to cover a Cu-Pb-Zn-Ag target. Dykes and sills of marginal zones of the Quiet Lake Batholith intrude rocks of probable Lower Paleozoic age - paragneiss, quartzite, marble and minor skarn. Mineralization consists of chalcopyrite, galena and sphalerite in narrow discontinuous beds of calc-silicate-bearing marble. This year's work included geological mapping, soil geochemical sampling, VLF-EM and magnetic geophysical surveys.

Fifty-nine km west-northwest of Dawson and south of the Yukon River, Cominco conducted follow-up work on a soil Pb-Zn-Hg anomaly on their MICKEY claims. Underlying the property is black carbonaceous phyllite intercalated with quartzite. One diamond drill hole was drilled for 183 m and very low-grade disseminated Pb-Zn mineralization was encountered with local narrow sections grading up to 2% Pb-Zn.

On the west side of the Coal River, Archer, Cathro and Associates conducted soil geochemical sampling and geological mapping on the FYIQ claims which cover the contact between a granodiorite pluton and Lower Paleozoic carbonates. The target is Pb-Zn-Ag mineralized skarn.

TUNGSTEN

Tungsten again proved to be the main "other" material searched for in 1981.

Mactung was the object of continuing feasibility studies by Amax. The estimated geological reserve released in spring 1981 was 57 million tonnes grading 0.95% WO_3. At the Logtung W-Mo deposit east of Teslin, Amax proceeded with environmental base line data collection, preliminary engineering studies regarding plant design, housing and power alternatives, geotechnical site investigations and general metallurgical studies.

Noranda continued work on their RAIL claims on the north side of the Yukon River, 35 km northwest of Dawson. Coarse-grained calc-silicate-sulphide-scheelite contact skarn occurs as intermittent felsenmeer and float over a six km length along the northern contact of a quartz monzonite stock. Last year's diamond drilling showed the skarn to be up to 120 m thick, and this year, trenching, geological mapping and soil geochemical sampling programs were carried out.

In the Mayo area, Du Pont conducted a diamond drill program (3 holes totalling 396 m) on the Two Buttes property optioned from M. Cloutier. The holes intersected a 10-15 m thick quartz-calcite-garnet-diopside skarn with values of trace to 0.1% WO_3.

A significant tungsten property near Kalzas Twins southeast of Mayo was optioned by Union Carbide from J.D. Randolph of Mayo. It is covered by the WOLF, PAT, DAVID and BLACKIE claim groups. The showings were discovered in 1978 while Mr. Randolph was supported on a Prospector's Assistance Grant from the federal government. The mineralization, most of it in float, consists of several centimetres to 60 cm thick quartz-wolframite veins with associated stockwork, and silicified country rock quartzite and grit of Hadrynian age. Geological mapping and rock and soil geochemical sampling programs were conducted.

North of Mayo in the Dublin Gulch area, Canada Tungsten continued evaluating their scheelite-bearing skarn deposit at Ray Gulch. The geological controls of mineralization were clarified by studying the local stratigraphy and structure. Trenching on the eastern part of the deposit disclosed a zone of relatively high-grade mineralization. Past estimated reserves are 7,250,000 tonnes of 0.50% WO_3 including 3,625,000 tonnes of 0.96% WO_3.

Hudson Bay Exploration and Development continued work on the CAB property optioned from Risby Tungsten Mines. Geological mapping and a diamond drill program of nine holes for 2,200 m resulted in extension of the No. 2 zone downdip. This zone consists of two scheelite-bearing skarn horizons developed in sedimentary rocks and lying parallel to the contact between the sedimentary rocks and a quartz monzonite stock. The lower and most persistent of the skarn horizons extends for a strike length of 660 m and for a vertical depth below outcrop of 350 m. Best intersections recorded in drill core were 3.4 m grading 1.34% WO_3 in the lower skarn and three m grading 1.39% WO_3 in the upper skarn. A 14.0 m section grading 0.68% WO_3 was also encountered in the upper skarn.

The CLEA tungsten prospect of Placer Development was the object of a further five diamond drill holes totalling 1,622 m. Geological mapping and prospecting were also conducted.

Serem worked on several skarn properties in southeastern Yukon, mainly in the Rancheria area:

CLAIMS	NTS	WORK
URSUS	105 B 8/9	Geological mapping, soil geochemical sampling, geophysical survey.
TEAM	105 B 10/15	Geological mapping, soil geochemical sampling, trenching geophysical survey.
CABIN	105 B 9/10	Geological mapping, trenching.
STONEAXE	105 B 10/15	Geological mapping, soil geochemical sampling.
SOURCE	105 B 11	Geological mapping, prospecting.
LOOTZ	95 D 7	Geological mapping, soil geochemical sampling.

The Boulder Creek area near Rancheria saw property work on a prospect intermittently worked since 1943, the FIDDLER, by a joint venture of Amax-Pan Ocean and Serem. One diamond drill hole totalling 549 m was drilled to test scheelite-bearing skarn and associated base metal quartz veins.

Near the headwaters of the Coal River, Noranda worked on their ROSE claims, where a magnetite-calc-silicate-sulphide skarn occurs at the contact of a granodiorite-quartz monzonite body with limy shale of the Rabbitkettle Formation. Two lens-shaped showings approximately 3 m long and 0.5 m wide were trenched by blasting and grab sample analyses up to 0.5% WO_3 are reported. Geological mapping and geophysical surveys were also done.

Northwest of Rancheria, Canadian Occidental worked on the GOAT claims, which are underlain by a screen of Cassiar Platform metasedimentary rocks within the Cassiar Batholith. Mineralization consists of calc-silicate-pyrrhotite skarn with W, Cu and Zn values and late stage fracture fillings of galena and sphalerite. Work consisted of soil geochemical sampling, geological mapping and VLF and magnetic geophysical surveys.

In the Aishihik Lake area on the west side of Sekulmun Lake, Canadian Occidental Petroleum worked on the HATCH and THATCH claims. They are underlain by marble and quartzite intruded by Mesozoic granitic rocks and mineralization consists of float of magnetite-pyrite-molybdenite-scheelite-bearing skarn. Geological mapping, soil geochemical sampling, magnetic and VLF-EM geophysical surveys were conducted.

Island Mining and Explorations conducted a diamond drilling program on their WAYNE claims near Keno City. Fourteen holes totalled 1,212 m. They were testing a high-grade silver vein target but intersected skarn in the Upper Schist unit over an area of 70 m by 100 m. Mineralized sections contained up to 2.07% tungsten and 5.0 g Au/t across 0.45 m and up to 0.48% tungsten and 33.3 g Au/t across 1.0 m.

Archer, Cathro and Associates worked on five contact skarn properties in the southeastern corner of Yukon:

CLAIMS	NTS	WORK
SPORK	95 D 14,E 3	Magnetometer and EM 16 surveys, soil geochemical sampling, geological mapping.
CREAM	95 E 6	Magnetometer survey, soil geochemical sampling, prospecting and geological mapping.
VNER	95 E 6	Magnetometer survey, soil geochemical sampling, prospecting and geological mapping.
SNEET	95 E 3	Magnetometer survey.
IVO	95 E 3	Diamond drilling (10 holes, 1,220 m), soil geochemical sampling, magnetometer and EM 16 survey, geological mapping.

GOLD-SILVER

Precious metals were actively sought by many concerns, especially in western Yukon. In the Aussie Creek area 90 km east of Dawson, Rio Tinto trenched and sampled their gold-bearing zone of silicification on the IDA claims. They also did minor geological mapping and multi-element geochemistry on a gold target located on the STROKER claims 85 km north of Mayo.

Near Upper Bonanza Creek, Archer, Cathro and Associates conducted soil geochemical sampling programs on the Lone Star property for Dawson Eldorado Explorations and a positive gold soil anomaly 150 m by 850 m was determined. They also sampled a quartz-carbonate alteration zone on Cone Hill covered by the TEFATJV claims, but only a subtle geochemical anomaly was discovered.

Northwest of Carmacks, Hudson Bay Exploration and Development continued work on their Sonora Gulch option. Geology consists of a rhyolite porphyry plug with associated gold-sulphide-bearing quartz veins. Six diamond drill holes totalling 812 m tested EM-16 anomalies interpreted to be caused by quartz-veins in fractures. Additional EM-16, magnetometer, and soil geochemical surveys were conducted.

On Freegold Mountain, Archer, Cathro and Associates worked on the Rambler Hill rhyolite porphyry plug for Arctic Red Resources. The plug carries disseminated pyrite with associated low values in gold and silver over distances in the order of 100 m. Ten diamond drill holes were drilled for a total of 1,193 m and minor soil geochemical sampling was conducted. Arctic Red Resources also started rehabilitation of the adit on the nearby Laforma quartz vein.

The Emmons Hill gold-antimony quartz vein showings on the east flank of Freegold Mountain are covered by the DART claims of Noranda. Further to their diamond drilling program last year, this year's follow-up work consisted only of minor trenching.

Northeast of Freegold Mountain and 64 km northwest of Carmacks, Silver Tusk Mines continued underground exploration and development of their quartz veins on Tinta Hill. A total of 973 m of drifting and crosscutting from two portals has been done, exposing veins 1 and 2 for 305 m. Forty-five drift face samples taken along 94 m of the No. 1 vein gave an average value across a true width of 11.8 cm of 6.8 g Au/t, 164 g Ag/t, 0.95% Cu, 5.63% Pb and 13.22% Zn.

Twenty km northwest of Freegold Mountain, Archer, Cathro and Associates staked the NITRO claims for the NAT Joint Venture over a potential gold porphyry target, the old Klazan property. Some soil geochemical sampling work was conducted. Archer, Cathro and Associates continued property work on their LILYPAD, GNAT, NEWT claim group on Prospector Mountain where several persistent high-grade argentiferous quartz-carbonate veins occur in Mt. Nansen Group volcanic rocks. Reconnaissance soil geochemical sampling, geological mapping and 117 bulldozer trenches constituted the property work. Reconnaissance soil geochemical sampling and geological mapping were conducted on the nearby NIT claims. Also nearby, Archer, Cathro and Associates conducted reconnaissance soil geochemical sampling and geological mapping programs over their NUCLEUS claims which are largely underlain by felsic hypabyssal rocks of the Late Cretaceous Mount Nansen Group.

On Jubilee Mountain, several diamond drill holes tested a previously known gold showing in mafic volcanic rocks.

Southwest of Whitehorse in the Wheaton River area, AGIP staked the KUKU 1-331 claims over much of the Late Cretaceous to Early Cenozoic volcanic rocks. Work consisted of reconnaissance and detailed stream sediment geochemical sampling, geological mapping, prospecting and trenching of several soil geochemical anomalies.

SILVER (LEAD, ZINC)

1981 saw an active search for silver as companies looked more favourably at the economic viability of high-grade small-tonnage targets.

Prism Resources proceeded with underground development of their argentiferous carbonate-quartz-limonite-galena vein on the VERA property 112 km northeast of Mayo. The vein occupies a steeply dipping fracture that has been drifted into for over 500 m and consists of two ore shoots: a West Zone and an East Zone. The first 131 m through the West Zone assayed 695 g Ag/t over a drift width of three m. By early fall 1981, drill indicated reserves of 851,733 tonnes of 305 g Ag/t were determined.

North of Mayo 110 km, Archer, Cathro and Associates staked the BLENDE claims over a silver-lead-zinc vein in dolomite of the Proterozoic Fairchild Lake Group. The vein is over 900 m long and has grades up to 2,000 g Ag/t.

Canada Tungsten investigated several silver properties in the general Keno Hill area. They optioned the Mount Keno Mines property, reopened the old adit and channel sampled the vein. Grades averaging 8,550 g Ag/t and 30-40% Pb were obtained about 30 m into the adit across a vein thickness of 0.3 m. On the ZAP claims, two diamond drill holes were drilled for a total of 366 m, the target being zones of vein fault breccia. They also conducted programs of geological mapping, trenching and sampling in the Rambler Hill area and on the IDAHO GENERAL claims.

Turner Energy and Resources completed a soil geochemical sampling and electro-magnetic survey of their property on Rambler Hill adjacent to the United Keno Hill Mines Ltd. mine.

Southwest of Rancheria, Canadian Occidental Petroleum worked on the LICK claims, underlain by massive and cataclastic granitic rocks of the Cassiar Batholith and minor metasedimentary rocks. Mineralization consists of very minor veinlets of galena, sphalerite, pyrite and quartz in shear zones in the granitic rocks. Programs of geological mapping, rock and soil geochemical sampling were conducted.

On the Mt. Hundere property of Cima Resources the 1981 drill program confirmed the eastward continuation of the mineralization encountered in the 1980 drilling. The best intersection contained 5.37 m of 16.16% Pb, 1.35% Zn and 1,858 g Ag/t. Four drill holes on the West showing indicated discontinuous low - grade mineralization of limited extent. One hole was drilled on the North showing where three mineralized bands occur over a strike length of 60 m and intersected mineralization grading 7.88% Pb, 14.72% Zn and 29.5 g Ag/t across 1.5 m.

COPPER

The search for copper was similar in intensity to last year, i.e., low key.

United Keno Hill Mines continued working west of Carmacks on several properties: STU, FIL, MOON, DEF, DAD, HI, NOON. The target of interest is disseminated copper mineralization in foliated granodiorite, i.e., Minto-type mineralization. Basic geological mapping and soil geochemical sampling were conducted. More than 24,500 soil samples were analyzed for Cu, a few for Ag and an even lesser number for Pb, Zn, Ag and Au. EM and magnetic airborne geophysical surveys were also run.

Esso Minerals investigated a pyritic massive sulphide body on the JULIA claims of Welcome North, 140 km southeast of Ross River. Three diamond drill holes resulted in a massive pyrite intersection greater than 10 m thick with low copper-gold values, and the option was subsequently dropped.

Mattagami Lake Exploration continued work on the MARN skarn, 55 km north-northwest of Dawson. Cu-Ag-Au values occur in a massive pyrrhotite-chalcopyrite-arsenopyrite phase of a diopside-amphibole skarn. Minor geological mapping and 1,000 m of diamond drilling were conducted.

MOLYBDENUM

Molybdenum exploration was restricted to continuing work on several widely separated properties. Union Carbide worked on the RENA claims optioned from Welcome North in the Frances Lake area. Geology consists of a potassic multi-phase quartz monzonite porphyry containing veins of quartz-pyrite-sericite and a stockwork of magnetite-chlorite-molybdenite. Work this year consisted of geological mapping and rock geochemical sampling.

Amoco and Tintina Silver continued work on their Red Mountain molybdenum porphyry 50 km east of Whitehorse. Six diamond drill holes totalling 3,963 m were drilled this year. An intersection from a previous diamond drill hole (number 24) was reported to assay 0.273% MoS_2 over 251.2 m. In addition, reconnaissance geochemical sampling and geological mapping programs were conducted in the general Red Mountain area.

On the PLUTO property 54 km west-northwest of Dawson, Cominco in joint venture with Getty Mines conducted a diamond drill program within a 1,525 m by 490 m oval area over a quartz-feldspar porphyry plug. Eleven diamond drill holes totalling 1,988 m resulted in intersections of low-grade molybdenum (0.02-0.05% Mo) and erratic tungsten values over lengths ranging from 60 m to 150 m.

In the Arrowhead Lake area of the Hess Mountains, AGIP worked on their ICE, FIRE and SUN claims. They cover a Cretaceous syenite intrusion which has hornfelsed the sedimentary country rocks. Extensive zones of thin veins bearing minor pyrrhotite, chalcopyrite, molybdenite, scheelite and arsenopyrite occur in the intrusion. Reconnaissance stream sediment and soil geochemical sampling, geological mapping and prospecting programs were conducted. In addition, systematic rock chip sampling and four short trenches tested several geochemical anomalies and a small uranium showing.

TIN

Property work continued in the two main tin areas, Rancheria and Mayo. Du Pont diamond drilled six holes totalling about 1,200 m on the DU and SWIFT claims in Rancheria area. The mineralized vein systems were intersected but only low values were encountered.

DC Syndicate diamond drilled the SIN claims optioned from Welcome North and subsequently dropped the option. Also in the Rancheria area, the tin-bearing skarn on the JC property was evaluated by Cominco on an option from DC Syndicate. Detailed geological mapping, an airborne magnetic survey and a nine hole, 1,673 m, diamond drill program was conducted. The program was not successful in defining a significant zone of mineralization and where mineralization was encountered, values generally did not exceed 0.2% Sn.

North of Teslin, Newmont continued working on their skarn in the Englishman's Group of metasedimentary rocks, the MINDY claims. The gently dipping marble that hosts the skarn is bounded by hornfels and chert, and the skarn itself forms a persistent horizon but the mineralization occurs erratically. Tin borate minerals, minor arsenopyrite and sphalerite are associated with magnetite-garnet skarn, and scheelite and chalcopyrite are associated with moderately massive pyrrhotite. Nine diamond drill holes were drilled for a total of 1,047 m. On the nearby MINDY 17-32 claims, a soil geochemical sampling and prospecting program was conducted but no mineralization was encountered.

The Cortin Joint Venture of Billiton, Canadian Nickel and Campbell Resources continued property work on their holdings in the Mayo area. Extensive trenching and eight diamond drill holes totalling 1,524 m resulted in an extension of the discovery zone on the EPD claims for several hundreds of metres. Drill intersections exceeding 1% Sn over widths in excess of 1 m are reported. In addition, geological mapping and soil geochemical sampling programs were conducted on the JOUMBIRA, MAHTIN, SNARK and BANDER claim groups. Geological mapping was also done on the JABBERWOCK claims.

Canada Tungsten worked on their West Ridge property - a program of geological mapping and soil, stream sediment and heavy mineral geochemical sampling. One bedrock tin-tungsten showing has been located in addition to four geochemically anomalous areas in tungsten and gold.

URANIUM

Uranium exploration maintained the same relatively low key as in 1980.

Archer, Cathro and Associates worked on several properties in the Wernecke Mountains, all of them associated one way or another with diatreme breccias intrusive into sedimentary rocks of Helikian age. They include the following claims and programs: WERNECKE - rock geochemical sampling; APE - geological mapping, radiometric survey, soil and rock geochemical sampling; BOND - MAX-MIN EM, IP and magnetic geophysical surveys and geological mapping; FACE - trenching and geological mapping; PIKE - trenching, radiometric survey and geochemical sampling; PTERD diamond drilling of three holes for a total of 915 m and some geological mapping.

Texaco Canada Resources and their joint venture operating partner Zelon Enterprises worked on the HAIL, IOTA, IRON, etc. claims in the Wernecke Mountains. Target of their reconnaissance prospecting was uranium associated with breccia pipes intrusive into Helikian sedimentary rocks.

Northeast of Whitehorse, AGIP conducted geological mapping, soil geochemical sampling and a radiometric survey over a Cretaceous granodiorite intrusion covered by the GAMMON claims.

ASBESTOS, BARITE

Asbestos exploration was restricted to the Clinton Creek area and to one company - Archer, Cathro and Associates. Claims and work consisted of TARTZHART, TOADSTEAK, TATER, TURK, TIZA, TJOP - excavator trenching and soil geochemical sampling and, TOC - trenching.

Interest in barite continued in line with the low level of 1980. There was continuing progress on the TEA deposit of Yukon Barite (option from Welcome North) near Macmillan Pass, and Millchem conducted a general property evaluation on their NO BEAVER (ST. BRIDGET) claims northeast of Dawson.

COAL

Sulpetro Minerals drilled a major deposit of subbituminous to lignitic coal in the valley of the Rock River northeast of Watson Lake. In late 1981, they drilled five holes, each about one kilometre apart and totalling 718 metres. Coal was found to depths of over 150 m but is variable from hole to hole.

GRASSROOTS EXPLORATION

A relatively high level of reconnaissance exploration was conducted. Cordilleran Engineering reconnaissance prospected in the Rancheria area in southern Yukon. United Keno Hill Mines prospected for Au, Ag in southwest Yukon as also did Du Pont, who covered the area between Carcross and Livingstone Creek. Reconnaissance exploration was also conducted by Canadian Nickel in the north part of Selwyn Basin around kilometre 198 on the Dempster Highway. Their program included rock and soil geochemical sampling for Pb, Zn, Ag across Paleozoic shales. In the same general area, Millchem conducted a grassroots geochemical reconnaissance exploration for barite. Noranda conducted a reconnaissance program in the Macmillan Pass area and SMDC a regional reconnaissance stream sediment and heavy concentrate geochemical sampling program in the Tay River - Sheldon Lake area. Gulf Minerals conducted a grassroots program in central and southern Selwyn Basin. In south-central Yukon, Getty Mines conducted a reconnaissance prospecting program for molybdenum. Eldorado did a reconnaissance search for uranium in southwestern Yukon using a combination of stream sediment and water geochemical sampling, prospecting and geological mapping.

PLACER MINING

Placer activity continued at a high level in 1981. The dramatic increase in the gold price in 1979 and 1980 initiated a frantic scramble by prospectors, mining companies and entrepreneurs to acquire properties with potential for placer concentrations of gold. The decrease in gold price during late 1980 and 1981 curbed the rush to acquire properties, but the number of claims staked increased as existing leases were converted to claims. The total length of claims and leases held increased from 2,000 km in 1978, to 3,500 km in 1979, to 5,830 km in 1980 and 6,200 km in 1981.

Prior to the rush to acquire property, most claims and leases were staked in "traditional" mining areas by individuals, and limited or no evaluation work was done prior to the start of mining. Staking has since spread to the periphery of the "traditional" mining areas, and has extended to areas with no previous history of mining, or even reports of placer gold concentrations. Some of the new properties are large, extending for 10's of kilometres along valley bottoms. Drill testing was undertaken in several areas during 1981.

The churn drill was previously the instrument of choice for testing placer properties, but new technology has produced several new types of drills. The Becker drill is a hammer drill, powered by compressed air. A rigid double walled drive pipe is forced into the ground, and the sample is washed up the inner pipe by compressed air. The Stenuick drill also uses a double walled drive pipe, but the inner pipe is equipped with a bit, and rotates eccentrically within the casing. The sample is again washed up the inner pipe by compressed air. The Hawker Siddeley drill uses hydraulic power combined with sinusoidal oscillations at frequencies up to 150 hz to force a single walled drive pipe into the ground. The sample is recovered as a core when the drive pipe is pulled. All these types of drills were used with varying degrees of success on Yukon placer properties during 1981. The cost of drilling with these units, which are mounted on tracked vehicles to facilitate their access to drilling sites, is approximately $125 per metre. Test holes are a minimum of 15 cm in diameter. Smaller diameter holes provide samples which are of no use for calculating the tenor of the deposit.

Seismic surveys were done in several areas to establish bedrock configurations and volumes of gravel. The survey results were inconclusive. Permafrost obliterated bedrock effects in each case. Magnetometer surveys were done in an attempt to delineate placer concentrations of magnetite, but again met with no success.

Bulk sampling programs were carried out on a number of properties. Some of these programs were of a scale larger than some of the smaller mining operations.

Mining operations were carried out in the Sixtymile, Klondike, Clear Creek, Minto Lake, Haggart Creek and Burwash regions as well as other widely distributed areas. The trend from small, private operations to large, corporate operations continued. In 1978, only nine operations had 10 or more employees. There were 15 such operations in 1980, and about 20 in 1981. Most mined using bulldozers and sluice boxes. Wheel tractor scrapers were used at a number of operations where there was room for them to maneuver, and where gravel had to be transported more than a few metres to the washing plant. Grizzlies and stationary and moving screens gained popularity as the benefits of classifying material being fed to the washing plants became apparent.

Two underground mines were begun on Hunker and Miller Creeks in an attempt to recover rich gold-bearing gravel from immediately above bedrock in buried Tertiary White Channel deposits.

The decrease in the price of gold in late 1980 and 1981 affected placer miners. Coupled with increases in the costs of equipment, fuel, interest charges and other expenses, the lower price paid for gold recovered forced several operators to curtail mining at mid-season. Most operators claim, however, that given placer gold concentrations of average grade, and 1981 operating costs, work can be carried out profitably as long as the price of gold remains above $400 U.S. per ounce.

The Yukon placer mining industry is one of significant proportions. In 1980, it provided 329 man years of work for 788 employees. The secondary impact of the industry resulted in a further 459 man years of work for 929 employees in Yukon, and in additional work outside the territory.

Total Canadian gold production has been decreasing steadily over the past decade, at the same time the production of placer gold in Yukon has been increasing (see Figures 6 a,b,c,d). Yukon placer gold production has rocketed from 0.19% of total Canadian gold production in 1970 to 3.77% in 1980. Placer gold on which royalty was paid in Yukon in 1980 totalled 58,573 fine ounces and in 1981, royalty was paid on 99,988 fine ounces of gold.

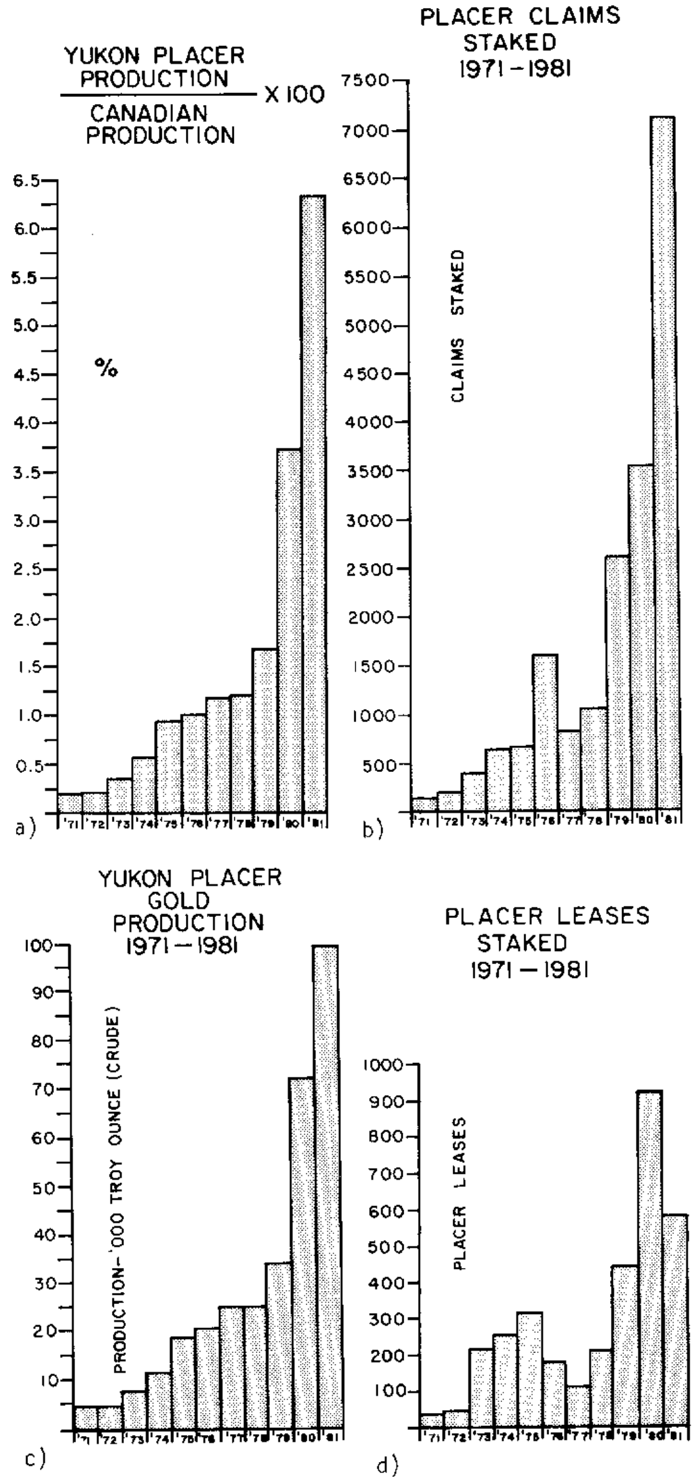

Figure 6 a,b,c,d

a) Placer leases staked in Yukon, for the period 1971 to 1981; b) Placer claims staked in Yukon for the period 1971 to 1981; c) Yukon placer gold production for the period 1971 to 1981; d) Yukon placer gold production expressed as a percentage of Canadian gold production.

MINERAL EXPLORATION IN YUKON AND
WESTERN DISTRICT OF MACKENZIE:
DEPOSIT DISCOVERY RATE AND
EXPLORATION POTENTIAL

Grant Abbott
Geology Section
D.I.A.N.D.
Whitehorse, Yukon

Mineral exploration in Yukon and western Northwest Territories has undergone an unprecedented boom that began in 1965. The first part of this paper measures the results of that boom by comparing exploration levels and expenditures versus deposit discovery rate. This comparison shows that exploration intensity as measured by number of claims staked annually has not increased but exploration expenditures have increased from about $4-million in 1965 to $50-million in 1981. The discovery rate has remained steady at about two deposits annually and 31 of the 41 'significant' known mineral deposits have been proven since 1965. The second half of the paper reviews recent exploration highlights and discusses the exploration potential for various commodities.

Figure 1 shows the number of claims staked in Yukon and is a crude measure of the relative level of exploration activity directed towards the discovery of new mineral deposits. It shows that we are in the midst of an exploration boom that began with the discovery of the Anvil orebody in 1966 and presently, between 10,000 and 12,000 claims are staked annually. Recently we have not seen the wild swings of the late 60's and early 70's that resulted from staking rushes following the discovery of significant new types of orebodies.

Figure 2 is a different measure of exploration activity that shows the amount of money spent on exploration in Yukon annually. It shows a dramatic increase in expenditures from less that $5-million (1981) dollars) in the late 1960's to present levels of about $50-million. This increase reflects increased exploration costs and advanced exploration of several large, significant mineral deposits as well as higher levels of exploration in general.

Exploration success and the size and rate of discovery of new mineral deposits is shown in Figure 3. The value in September 1981 dollars of all mineral deposits in Yukon and western Northwest Territories with proven, probable or inferred reserves is plotted on the year in which these reserves were established and not on the year that the original deposit was discovered. This method allows comparison of exploration expenditures with results. The vertical scale is logarithmic and shows the wide range of value and size of known deposits. For comparison, the total dollar value of all gold taken from the Klondike, all ore extracted from the Keno Hill camp and the dollar value of all producing or past producing mines is also shown.

Most deposits on this chart are uneconomic, now and in the foreseeable future. In other words, the dollar value of a deposit serves as a rough basis for comparison of size and potential, but not necessarily of present economic significance. This measure is valid because the size of mining operations that each of these deposits would support, if economic, is about the same as that of present producing mines with the same approximate value. That is, deposits measuring between $10- and $100-million would support a mill with a capacity of less than 500 tonnes/day, those between

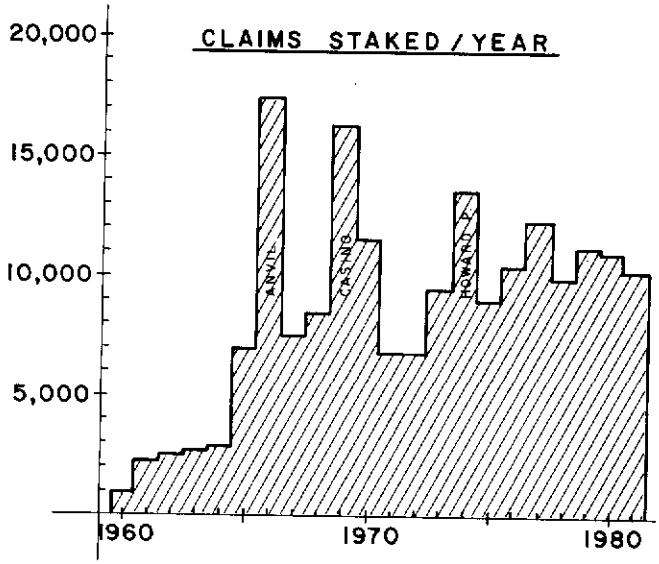

Figure 1

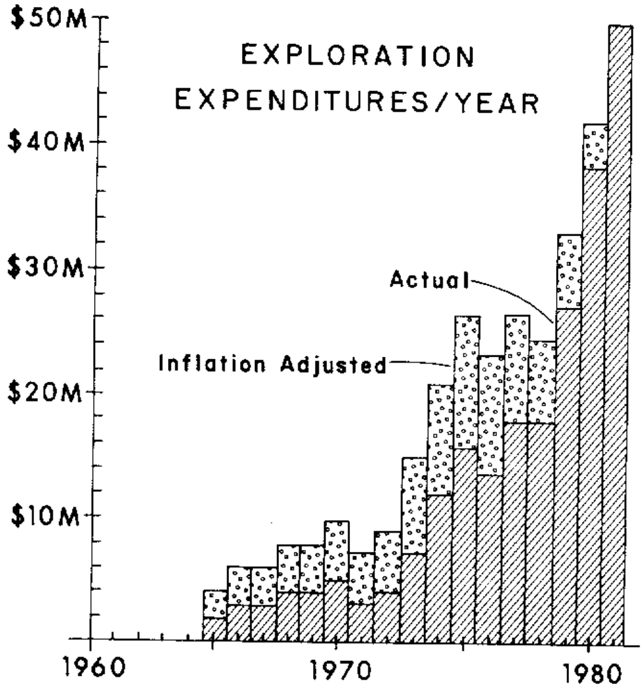

Figure 2

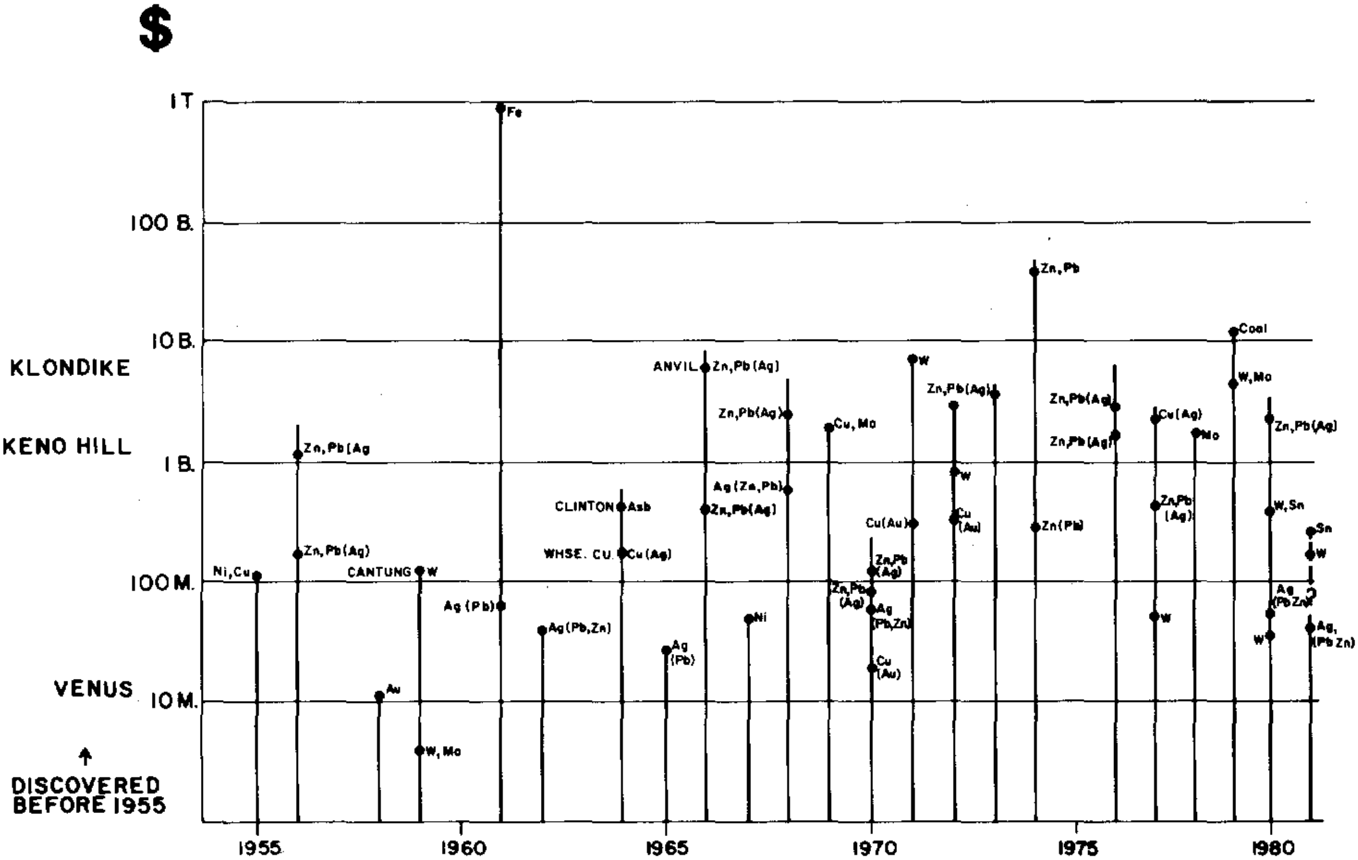

Figure 3

$100- and $1,000-million would support a 500 to 5,000 tpd operation and those measuring more than $1-billion could operate at greater than 5,000 tpd.

MAJOR DISCOVERIES

There are 43 known mineral deposits with proven, probable, or inferred reserves in Yukon and western Northwest Territories (Table I). Since 1965, 32 have been 'proven'. Of these, only nine were discovered prior to 1965 and all others were both discovered and proven since then. Therefore, the total inflation adjusted exploration expenditure of about $300-million since 1965 has resulted in the proving of 32 deposits at an average cost near $10-million per deposit.

Of note is the high number of very large deposits that have been explored during the middle and late 1970's. Some of these, although shown to have proven reserves several years ago are still under active exploration. The expenditures required to explore deposits of this size account for the increased exploration expenditures seen during the last few years. Some of these deposits are Grum, Dy, Goz, Tom, Jason, Howard's Pass zinc-lead (silver) deposits; Bonnet Plume coal, Red Mountain molybdenum, Logtung molybdenum and tungsten, Ray Gulch tungsten, and Redstone copper deposits.

The rate at which deposits have been proven in Yukon since 1965 is fairly constant at slightly less than two per year. The rate of initial discovery has also remained constant except for the last two or three years when few significant new deposits have been found. This lack of new discoveries may be real and may forecast a drop in exploration expenditures. Alternatively it may reflect lack of public knowledge of significant discoveries and/or the early stage of exploration on some deposits that may later prove to be significant.

EXPLORATION TRENDS

A subjective graph of the relative intensity of exploration for various commodities, Figure 4 shows that exploration has evolved from an early stage when the search for one deposit type or commodity was dominant, to the present, when the overall level of activity is higher than in the past but is divided among a variety of commodities. Trends for asbestos and coal are not shown because their exploration has been sporadic and of low intensity.

A variety of factors, different for each commodity or commodity group has influenced the course of exploration. Some have undergone booms as a result of either the discovery of new types of deposits (Anvil lead, zinc, silver) and Casino (porphyry copper molybdenum) with size and potential ($1- to $10-billion) previously unmatched in Yukon, or from sudden economic interest rather than large new discoveries (uranium, silver, gold). Tungsten exploration on the other hand has maintained a steadier pace because tungsten tends to occur in deposit types known since the late 1950's and deposits are restricted to geologically well defined areas. Thus, new discoveries do not suddenly give large areas a higher potential for new discoveries.

The general areas where the various commodities occur and where new discoveries are most likely to be found are shown on commodity potential maps (Figure 5-13). Open circles show areas with relatively high potential, diagonal lines show areas with low to moderate potential and blank areas have little or no potential. Dots show significant deposits not presently being explored, squares show producing or past producing mines and triangles show deposits under active exploration. Some of these are known to be significant, others are not.

Uranium

Uranium exploration (Figure 5) was spurred in the mid-1970's by oil price increases and the energy crisis. Interesting discoveries were made mainly in north-central Yukon but none proved to be economically significant. As a result, exploration declined and will remain minimal unless a spectacular new deposit is found (unlikely).

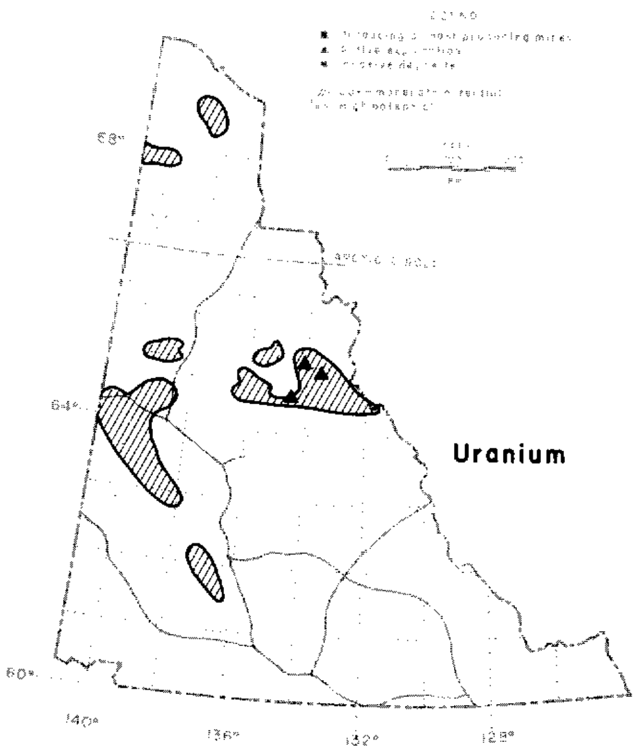

Figure 5

Coal

Coal exploration (Figure 6) in Yukon has been sporadic but long lived. Recent activity, like that for uranium, followed the energy crisis and resulted in the proving of large reserves of thermal grade coal in the Bonnet Plume Basin by Pan Ocean Oil (now Aberford Resources Ltd.). These deposits are presently inactive, though feasibility studies to build a generating station near the deposits have been conducted. Present reserves have a value of about $10-billion and could probably be increased several times over if demand were sufficient. Coal is widespread in Yukon but there are no other known deposits with the same size as the Bonnet Plume deposits. Some are likely but economic factors indicate that exploration in the near future will remain at a low level.

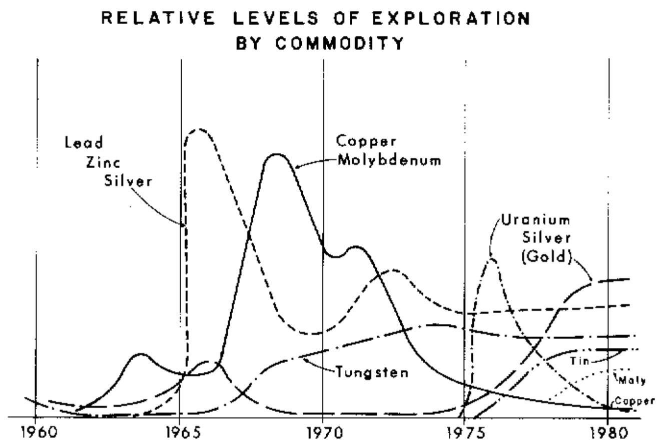

Figure 4

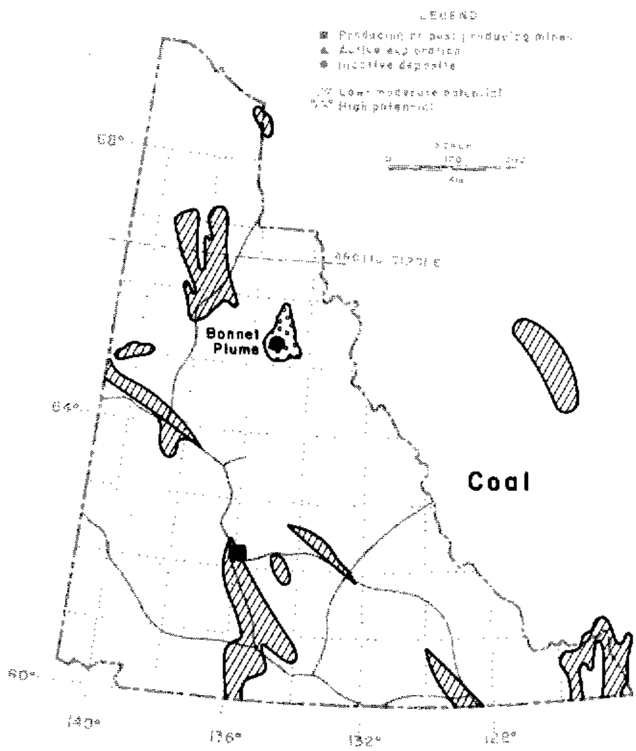

Figure 6

TABLE 1

DEPOSIT	TONNES	GRADE	TOTAL VALUE ($ CAN.)	DATE DISCOVERED	DATE PROVEN
United Keno[2a] (Total Production)	3,565,810	980.00 gm/t Ag 5.8 % Pb 4.19 % Zn	1,753,515,700	Before 1945	Before 1945
Venus[1]	108,852	7.54 gm/t Au 225.29 gm/t Ag	22,976,300	Before 1945	
Wellgreen[1]	568,235	2.04 % Ni 1.42 % Cu	125,123,300	1952	1955
Vangorda[1]	8,526,740	7.96 % Zn 3.18 % Pb 0.27 % Cu	1,104,592,500	1953	1956
McMillan[1]	907,100	10.0 % Zn 5.0 % Pb 61.71 gm/t Ag	191,255,100	Before 1945	1955
Cache Creek[1]	68,032	12.0 gm/t Au	13,543,800	1954	1958
Cantung[6] (Main Zone)	1,176,400	2.47 % WO_3 0.45 % Cu	130,092,700	1954	1959
Stormy[1]	13,506 15,420	0.73 % Mo 1.05 % WO_3	4,407,300	1955	1959
Crest[1]	19,142,000,000	40.0 % Fe	933,759,740,000	1961	1961
Ketza River[1]	174,163	12.0 % Pb 582.0 gm/t Ag	61,555,700	1947(?)	1961
Eagle (Tintina)[1]	90,710	695.70 gm/t Ag 6.00 % Pb 10.00 % Zn	41,634,100	1961	1962
Clinton Creek[7,9]	21,836,377		550,000,000	1957	1964
Brown-McDade[1]	259,000	445.70 gm/t Ag 11.30 gm/t Au	88,985,900	1962	1964
New Imperial	4,114,541	2.14 % Cu	194,119,400	1964	1964
Peso-Rex[1]	139,693	3.70 % Pb 716.00 gm/t Ag	43,706,100	Before 1945	1965
Faro[4]	57,600,860	3.40 % Pb 5.70 % Zr 40.90 gm/t Ag	7,394,821,600	1965	1966
Swim Lake[1]	4,300,000	4.70 % Zn 3.80 % Pb 47.00 gm/t Ag	518,184,200	1965	1966
Canalask[1]	453,550	1.50 % Ni	62,994,100	1953	1967
Gayra[5]	50,000,000	5.00 % Pb/Zr	3,306,925,000	1974	1976
Bailey[1]	405,454	1.00 % WO_3	58,385,400	1963	1977
Mel[1]	4,781,933	2.05 % Pb 5.60 % Zn	462,781,300	1967	1977
Redstone[1]	27,625,791	3.90 % Cu 11.31 gm/t Ag	2,494,090,700	1961	1977
Red Mountain[1]	90,710,000	0.10 % MoS_2	1,895,822,600	1977	1978
Bornet Plume[1]	135,000,000	Coal	10,125,000,000	(?)	1979
Logtung[1]	160,000,000	0.12 % WO_3 .052 % MoS_2	4,503,665,000	1977	1979
Cab (Risby)[1]	341,800	1.02 % WO_3	50,203,600	1968	1980
Hundere(?)[5]	69,099 54,910 122,500	15.60 % Pb 18.90 % Zn 73.40 gm/t Ag 11.52 % Pb 13.15 % Zr 65.60 gm/t Ag 4.60 % Pb 7.00 % Zn 90.50 gm/t Ag	70,151,900	1962	1980
Ray Gulch[3a]	8,000,000	0.50 % WO_3	576,000,000	1978	1980
Jason[8]	grade and tonnage at least equal to Tom.		2,600,000,000	1975	1980
Prism[3b]	226,800	3.50 % Pb/Zn 411.40 % Ag	42,182,500	1978	1981

TABLE 1 (cont)

DEPOSIT	TONNES	GRADE	TOTAL VALUE ($ CAN.)	DATE DISCOVERED	DATE PROVEN
Prairie Creek[1]	2,140,000	13.50 % Zn 10.90 % Pb 0.50 % Cu 192.00 gm/t Ag	806,650,200	Before 1945	1968
Tom[1]	8,163,900 9,071,000	8.40 % Zn 8.60 % Pb 96.00 gm/t Ag 4.60 % Zn 0.90 % Pb	2,620,797,200	1953	1968
Casino[1]	162,370,900	0.37 % Cu .039 % MoS_2	2,647,948,400	1968	1969
Clark[1]	129,364 79,463 85,500 56,876	220.50 gm/t Ag 4.99 % Pb 4.58 % Zn 191.70 gm/t Ag 4.54 % Pb 4.61 % Zn 303.40 gm/t Ag 6.51 % Pb 4.45 % Zn 350.40 gm/t Ag 7.36 % Pb 4.92 % Zn.	71,923,900	1967	1970
Cowley Park[1]	759,185	1.25 % Cu 5.44 gm/t Ag 0.195gm/t Au	24,946,800	?	1970
Hart River[1]	1,068,060	1.45 % Cu 3.65 % Zn 0.87 % Pb 49.70 gm/t Ag 1.40 gm/t Au	140,930,800	1966	1970
Matt Berry[1]	376, 446	6.25 % Zn 9.12 % Pb 148.46 gm/t Ag	90,203,500	Before 1945	1970
MacTung[3c]	57,000,000	0.95 % WO_3	7,797,600,000	1962	1971
Williams Creek[1]	14,513,600	1.00 % Cu	319,970,000	1970	1971
Cantung[2b]	4,200,000	1.60 % WO_3 0.23 % Cu	999,976,600	1971	1972
Minto/Def.[1]	6,550,200	1.86 % Cu 6.86 gm/t Ag 0.51 gm/t Au	341,092,800	1971	1972
Grum[1]	26,080,300	6.43 % Zn 4.07 % Pb 62.05 gm/t Ag	3,954,701,800	1973(?)	1973
Goz Creek[1]	2,500,000	11.0 % Zn	363,761,800	1973	1974
Howards Pass[1]	300,000,000	12.00 % Pb/Zn	43,200,000,000	1972	1974
Dy[1]	14,700,000	7.10 % Zn 5.60 % Pb .84 gm/t Ag	2,720,176,600	1976	1976

SOURCES

1 Canadian Mineral Deposits Not Being Mined in 1980; Mineral Policy Sector, Internal Report, MRI 80/7; Department of Energy Mines and Resources, Ottawa.

2 Canadian Mines Handbook (a) 1980-81 (b) 1977-78; The Northern Miner.

3 The Northern Miner (a) 4 June 1981, (b) 6 Aug 1981, (c) 16 Aug 1981.

4 Tempelman-Kluit, D.J. 1972 Geology and Origin of the Faro, Vangorda and Swim concordant zinc-lead deposits, central Yukon Territory, Geol. Suv. Can. Bull 208.

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6 Green, L.H. and C.I. Godwin GSC. The mining industry of Yukon Territory and southwestern District of Mackenzie, 1962; Geol. Suv. Can., Paper 63-38.

7 C. Brown pers. com.

8 R. Bailes pers. com.

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Asbestos

There has been little asbestos exploration in Yukon despite the fact that the Clinton Creek mine was an important producer for over 10 years. Few companies have expertise in this commoodity and until recently there were no methods to detect deposits buried beneath overburden. A new approach has involved experimental techniques to detect asbestos fibres in soil and initial results have been encouraging. The potential for new discoveries is therefore considered to be very high despite the fact that only a small area has this potential.

Copper

Copper exploration (Figure 8) has declined to a low level after a series of discoveries in the late 1960's and early 1970's. This decline is attributed to a sharp drop in copper prices and the related fact that no early discoveries proved to be economic. The fairly short exploration period may mean that there is a higher potential for new discoveries than for more intensively explored types of deposits such as stratabound zinc-lead (silver). The only significant new copper exploration has been in the Minto-Williams Creek area where United Keno Hill Mines has been active following the discovery of the Stu deposit.

Molybdenum

Molybdenum exploration trends have approximately followed those of copper until recently, when dramatic price increases made the metal more attractive than before. The Logtung and Red Mountain deposits (Figure 9) are large, with dollar values in the same order as Anvil ($1- to $10-billion) and other stratabound lead-zinc (silver) deposits. In 1981, the Logtung deposit was inactive but Amoco continued to intersect exciting grades of mineralization in drill holes at Red Mountain. However, the depth of good grade mineralization may make this deposit uneconomic for some time.

Staking rushes probably did not follow the discovery of these deposits because this type of mineralization has been known and explored for in Yukon since the late 1960's.

Geological controls of molybdenum deposits in Yukon are poorly understood and large areas have been given high and moderate potentials. There are however, few promising occurrences other than Red Mountain, Logtung and Casino despite a fairly long history of exploration. The overall potential therefore may actually be lower than that for many other commodities.

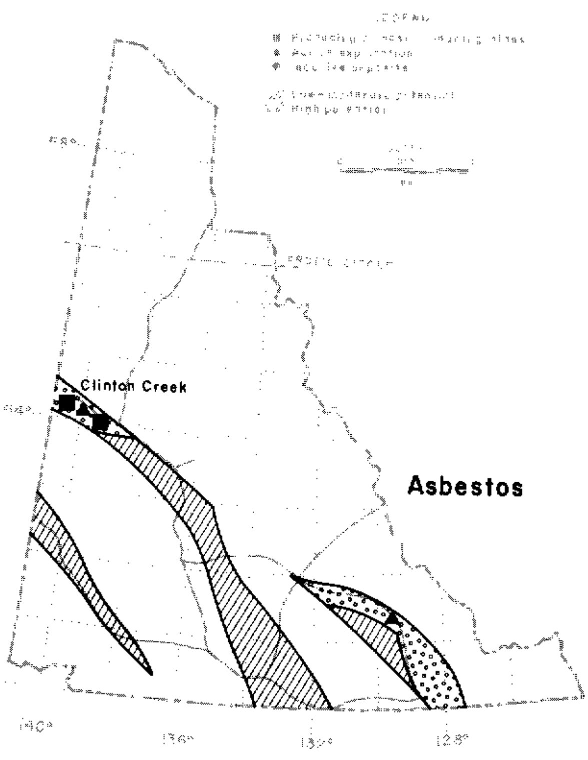

Figure 7

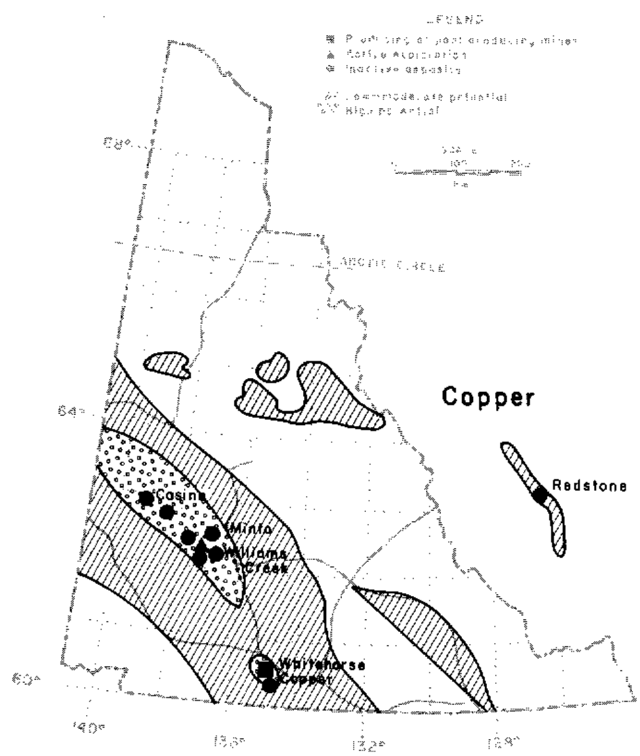

Figure 8

Precious Metals

A renewed interest in precious metals in the last few years has followed their spectacular rise in value. This increase is signalled by the development and short-lived opening in 1981 of the Venus Mine at 90 tpd south of Whitehorse and the Prairie Creek Mine east of Nahanni Park in the Northwest Territories. Also of note, is Prism Resources' silver-lead deposit northeast of Mayo which is comparable in size to other deposits near Mayo.

Most precious metal exploration has been directed toward previously known occurrences but the latest boom has also seen a search for new types of large tonnage, low grade deposits. However, it is too early to assess the success of exploration for this last type.

Zinc, Lead

Exploration for zinc, lead (silver) deposits (Figure 11) has been the mainstay of Yukon exploration throughout the late 1960's and 1970's because explorers have been consistently encouraged by a series of large, rich discoveries. With the exception of the Jason deposit, the last of these was the Dy in 1976.

Recent exploration has concentrated in the MacMillan Pass area where more than $10-million was spent on the Tom and Jason deposits in 1981. The economic potential of these deposits is tantalizing, but at least two more years of work are required on both before it is known if they are orebodies. Similarly, Placer Development continued underground exploration sampling of the Howard's Pass deposit, where a production decision does not appear to be imminent. Elsewhere, exploration continued on less significant occurrences along the eastern margin of Selwyn Basin, both northwest and southeast of the Faro camp and in the Pelly Mountains near the B.C. border.

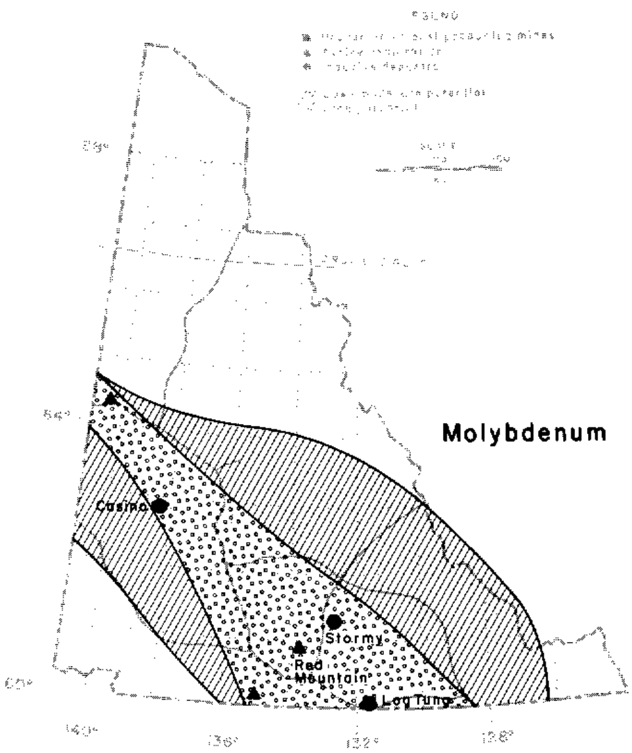

Figure 9

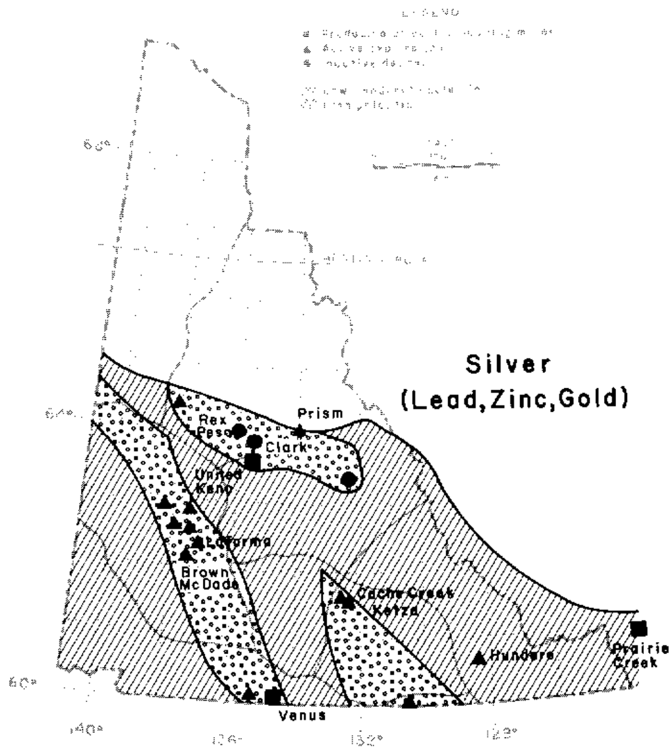

Figure 10

Tin

The last three years have seen the discovery and exploration of two new tin districts (Figure 12); one is situated northwest of Mayo and the other is the Seagull district in south-central Yukon. So far, only the JC Property, owned by Dome and Cominco appears to be sizable. The short exploration history and fact that tin is unusually difficult to find, suggests that the discovery potential is good.

Tungsten

Tungsten exploration (Figure 13) has maintained a steady, moderately high level of activity throughout the 1970's and has resulted in a steady string of successes. There are no signs that the discovery rate is slowing. Recent activity has concentrated on the intensive exploration of several properties scattered over a wide area of central Yukon. By far the most exciting is Canada Tungsten's Ray Gulch deposit located northwest of Mayo. Exploration is continuing on this deposit which is comparable in size to Cantung's operating mine, the E zone, but lower in grade. Promising results were also obtained from Union Carbide's Lened deposit in the Northwest Territories and an interesting new discovery of wolframite in breccias and vein stockworks was recently made near Kalzas Lake by a prospector from Mayo who optioned the ground to Union Carbide.

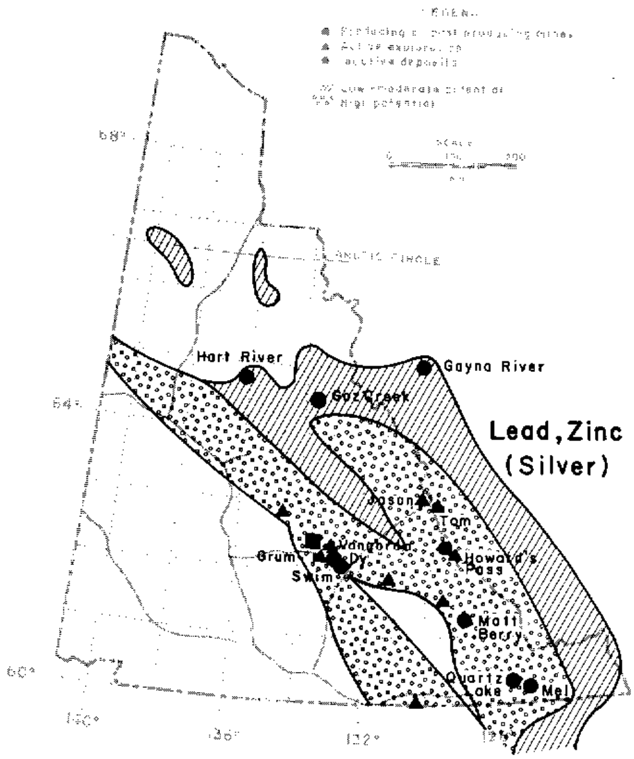

Figure 11

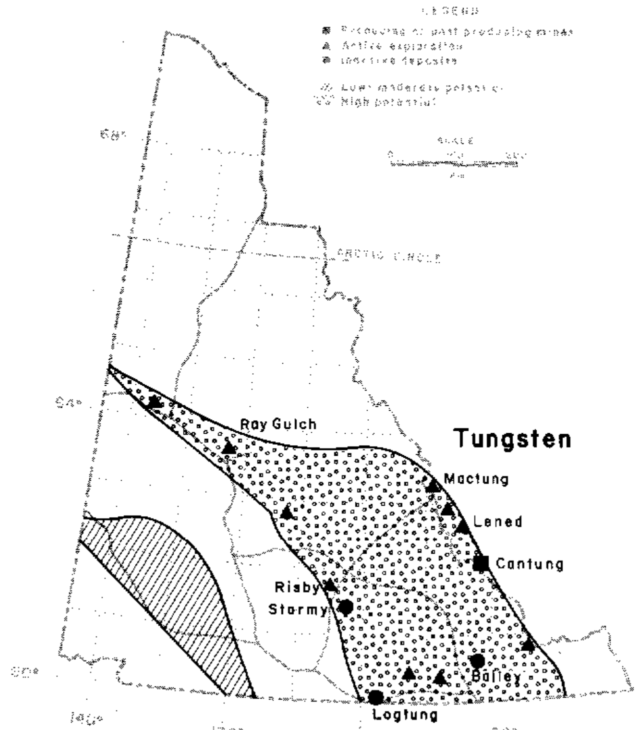

Figure 13

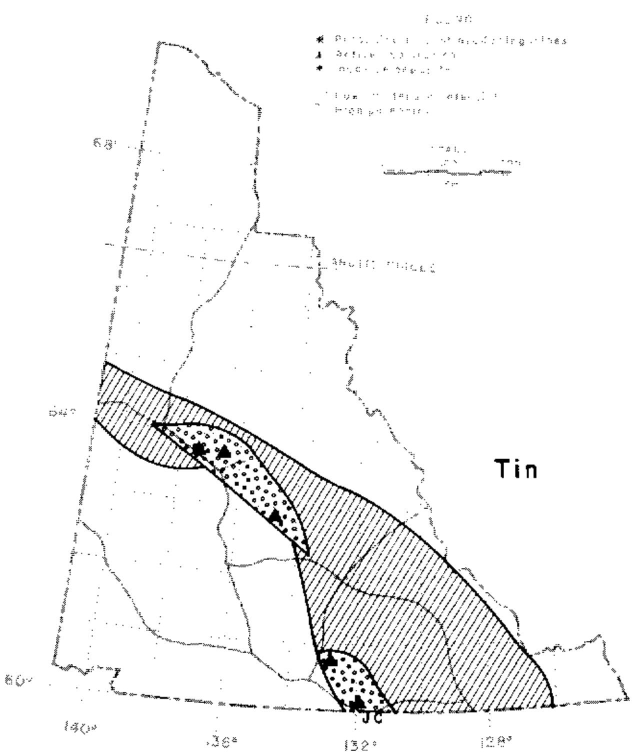

Figure 12

PROMISING OUTLOOK

During the last sixteen years, mineral exploration in Yukon and western Northwest Territories has undergone an unprecedented boom. Although only three new mines have come into production during this period (Anvil, 1969; Clinton Creek, 1967; Cantung's E Zone, 1974), thirty one significant mineral deposits have been found and/or proven. Almost all of these are presently uneconomic but the long term outlook is promising.

The overall discovery rate for new deposits has also been steady. Many new discoveries will certainly be made but the resources are finite and the discovery rate must eventually decline. The steady rate that we have seen is partly due to a broadening of the resource base with time and the decline has probably begun for most commodities. However, the most significant influence on discovery rate in the near future will probably continue to be economic rather than geological.

STRUCTURE AND STRATIGRAPHY OF
THE MACMILLAN FOLD BELT:
EVIDENCE FOR DEVONIAN FAULTING

by
Grant Abbott
Geology Section
D.I.A.N.D
Whitehorse, Yukon

ABSTRACT

This study describes the structural and stratigraphic setting of Devonian bedded barite and sedimentary exhalative lead-zinc-silver-barite deposits near MacMillan Pass in eastern Yukon. It shows that the deposits occur within MacMillan Fold Belt, an anomalous west-trending feature made up of three parallel elongate domains called the North, Central and South Blocks. Each is characterized by distinctive styles of deformation and Devonian strata.

The North Block is characterized by a thick Early and Middle Devonian chert and shale sequence included in the Lower Earn Group and by an intricate array of southerly directed thrust faults. The Central Block includes unusually thick Early and Middle Devonian silty limestone intercalated with volcanic and volcaniclastic rocks within the upper part of the Road River Group. The Tom and Jason sedimentary exhalative zinc-lead-silver-barite deposits are associated with a thick sequence of coarse clastic rocks thought to belong to a submarine fan complex within the Lower Earn Group. Tight upright folds, high angle reverse faults and irregularly oriented faults are characteristic.

In the South Block, the Lower Earn Group comprises a thin Devonian shale sequence. Open upright folds and few faults are the structural style. The differences in Devonian strata and contrasting style of deformation between blocks may reflect older (Devonian?) fault control to depositional patterns, but structures of that age have not been identified.

INTRODUCTION

This study examines the stratigraphic and structural setting of bedded barite, sedimentary exhalative lead-zinc-silver-barite and tungsten-bearing skarns near MacMillan Pass, in southeast Niddery Lake (105-O 1, 2, 7, 8) and southwest Sekwi Mountain (105-P-4) map-areas. Bedrock exposure is exceptionally good and further systematic mapping is planned for 1982.

Previous work includes reconnaissance mapping by Blusson (1971, 1974), and detailed studies of bedded barite by Dawson (1977, 1982 in prep), of the Tom and Jason Deposits by Carne (1979) and Winn et al (1981) and of the Mactung tungsten-bearing skarns by Harris (1976).

The writer thanks S. Gordey and geologists working for Hudson Bay Exploration and Development Co. Ltd., Pan Ocean Oil Ltd., Amax Exploration, Cominco and AGIP Canada Ltd., for cooperation, support and stimulating discussions. Discussions with D. Tempelman-Kluit and his constructive criticism of an early draft of this paper are greatly appreciated.

GENERAL GEOLOGY

The stratigraphy of the MacMillan Pass area is similar to that defined by Cecile (1980) in northeast Niddery Lake map-area (105-O) and by Gordey (1981a,b) in Nahanni map-area (105-I). These areas are at the boundary between Mackenzie Platform and Selwyn Basin and are underlain by sedimentary rocks ranging from late Proterozoic through Triassic.

Figure 1 shows the distribution of five main subdivisions within the sedimentary rocks. Lower Cambrian through Middle Devonian carbonate rocks define Mackenzie Platform. Early Ordovician and older clastic rocks include the "Grit Unit" and shaly equivalents of platform carbonate rocks of the Lower Cambrian Sekwi Formation and Cambro-Ordovician Rabbitkettle Formations. Ordovician, Silurian and Devonian shale, chert and less limestone of the Road River 'Group' makes up Selwyn Basin. Devonian through Triassic clastic rocks blanket Selwyn Basin and Mackenzie Platform and include the Devonian-Mississippian Earn Group and three younger, regionally mappable units. (Gordey et al 1982, in press). The Earn Group marks a profound change to sedimentation probably related to rifting or extensional faulting and includes two units of chert, shale, sandstone and chert pebble conglomerate. Bedded barite and lead-zinc-silver-barite deposits occur within the Lower Earn Group. Carboniferous quartz arenite, shale and limestone unconformably overlie the Earn Group and indicate a return to normal marine sedimentation. The two youngest units are Permian chert and shale and Triassic sandstone and shale. The sedimentary rocks are deformed and intruded by Cretaceous stocks and batholiths. These are not shown in Figure 1 for clarity.

Folds and faults near MacMillan Pass define a 30 km wide, 60 km long belt that trends west northwest across the general structural grain which is more northerly. The belt is here named the MacMillan Fold Belt.

STRATIGRAPHY

The geology of the MacMillan Fold Belt is shown in Figures 2 and 3. Three domains, called the North, Central and South Blocks, make up the Fold Belt. Each is defined by a different style of deformation and Devonian stratigraphy. Boundaries to the three blocks are shown in Figures 3 and 5. Idealized stratigraphic columns for each are shown in Figure 4.

In 1981, emphasis was placed upon understanding the complex Devonian stratigraphy. Less attention was paid to other strata and the assigned ages of many map units are inexact and their detailed stratigraphy was not determined. Microfossil collections made by the writer were identified by M. Orchard of the Geological Survey of Canada in Vancouver. All but two Cambro-Ordovician collections are described by Gordey et al (in press). Graptolite collections were identified by B.S. Norford of the Geological Survey of Canada in Calgary.

€Op

Map unit €Op, the oldest within the MacMillan Fold Belt, includes at least two divisions. The oldest is exposed in thrust slices in the North Block and belongs to the Proterozoic and/or Early Cambrian "Grit Unit". Maroon and green shale interbedded with minor brown weathering shale comprise most of the unit. Grey weathering, brown quartz grit and sandstone interbedded with recessive brown shale and siltstone were observed in one thrust slice. These rocks are not observed in contact with the slates but are presumed to underlie them. At least 200 m of strata are exposed. Lower contacts are tectonic and relations with overlying Cambrian and Ordovician strata are probably unconformable.

At the east end of the North Block, the oldest exposed rocks are resistant, dark grey weathering homogenous grey and grey-green slate more than 200 m thick. The grey slates are likely younger than the vari-coloured slates of the "Grit Unit", but may also be facies equivalents.

Buff to brown weathering phyllite about 200 m thick overlies the "Grit Unit" and the grey weathering slates. The phyllite is thinly laminated to homogenous and grey or pale green on fresh surfaces. Wispy lamination and flaser bedding are common in the upper part of the unit. Grey weathering limestone beds to 10 cm thick occur throughout. They make up nearly a quarter of the section in the east near Mactung and decrease to a single intermittent orange and grey weathering horizon up to 10 m thick at the top of the unit in the west. Limestone conglomerate 1 to 10 m thick occurs intermittently and mostly at the base. Most clasts are a few cm across, but some reach 20 cm. Clast shape varies from angular to rounded. Thickness and clast size increase from west to east and the conglomerates are interpreted to be debris flows derived from a carbonate bank margin east of the map area.

In the Central Block, unit €Op comprises dull brown weathering grey phyllite about 200 m thick. In the upper part, the phyllite is interbedded with conspicuous orange weathering laminae and thin beds of brown and grey weathering limestone. Lower parts of the unit are gray slate that weathers an even brown colour.

Limestone at the top of the brown phyllite at the western end of the North Block has yielded Early to Middle Ordovician conodonts. In the Central Block, Early Ordovician conodonts were obtained from thin limestone interbeds in the upper part of the unit. Graptolites from one collection in shale near the top of the unit are Early to early Middle Ordovician. These rocks are therefore time equivalent to the Rabbitkettle Formation (Blusson, 1971) found farther to the east within Mackenzie Platform. In the Central Block, the lower noncalcareous parts could be older. A regional unconformity that separates the Rabbitkettle Formation from older strata probably accounts for the absence of the thick sequence of grey slate in the west end of the North Block where the Cambro-Ordovician rocks overlie the "Grit Unit".

Road River Group (OSDpt)

The Road River 'Group' (OSDpt) includes three divisions. Medium-bedded, brown weathering chert with thin slate interbeds makes up the lower half of the lower division, and silver blue weathering thin bedded chert and black graphitic slate makes up the upper half. Near Mactung the lower division is about 100 m thick, but farther west it thins to 50 m. In the Central Block, the thickness reaches 100 m. Graptolites collected from the lower division are as old as late Middle to Late Ordovician and as young as Early Silurian.

The middle division is commonly referred to as the wispy mudstone or orange weathering mudstone. Brown to orange weathering bioturbated, flaser bedded pyritic green slate and mudstone are typical. The orange mudstone reaches 50 m in thickness, but interfingers with black shale and is missing in a few places. The wispy mudstone is lithologically like wispy laminated rocks in the upper part of unit €Opt, and the two units are easily mistaken in the field.

The upper division is referred to as the silty limestone unit, and consists of tan weathering, thin-bedded dark grey to black silty limestone. In the North Block, the silty limestone ranges from 0 to 70 m in thickness. Elsewhere, the thickness reaches 300 m. The silty limestone unit is in sharp contact with the underlying orange mudstone and appears to be gradational over a few metres with overlying black chert and shale of the Lower Earn Group. Conodonts collected from the top of the unit are as young as Early Devonian (Late Pragian to Early Emsian) in the North Block and Middle Devonian (Early to Middle Eifelian) in the Central Block. Graptolites collected near the top are Early Devonian (Pragian) in both blocks. The abrupt thickness changes between the North and South Blocks might be depositional and related to a 'growth' fault situated at the boundary between the two blocks but erosional truncation along an unconformity and/or a facies change to chert and shale of the Lower Earn Group is also possible.

Silurian (?) and Devonian Volcanics (SDv)

Within the Central Block, the silty limestone is intercalated with orange weathering volcanics, volcaniclastic rocks and related clastic sedimentary rocks (SDv). The volcanic rocks occur in at least two stratigraphic horizons. The oldest are lava flows several kilometres northwest of the Jason Property at or near the base of the silty limestone. They are resistant, massive dark grey weathering and up to 20 m thick and 1 km long. Fresh surfaces are grey-green medium- to coarse-grained and equigranular. Thin sections show equal proportions of dark green pyroxene and feldspar that are partially altered to chlorite and carbonate. Underlying rocks are baked, silicified and veined and replaced by orange weathering carbonate.

The younger volcanic rocks are mainly fragmental and are made up of angular dark green clasts 1 or 2 cm across in an orange weathering carbonate matrix. On weathered surfaces, fragments stand out to produce a distinctive nubbly texture. Orange weathering, thin bedded sandstone and siltstone derived from the volcaniclastic rocks are locally intercalated with them. The volcaniclastic rocks are intermittent, vary abruptly from 0 to 70 m in thickness and are in sharp contact with underlying and overlying strata. In most places they overlie the silty limestone, but locally are separated from it by up to 5 m of black cherty argillite that is also intercalated with the volcanic rocks.

Feeders to the volcanic rocks are common throughout the Road River Group in the Central Block. Most are irregularly shaped and many are plug-like, but few exceed 20 m in width. Feeder rocks include orange weathering massive, homogenous pale green varieties and breccias. The breccias contain sedimentary and intrusive fragments in a pale green carbonate-rich matrix. Alteration zones were not seen and volcanism was probably short lived and explosive.

The volcanic rocks are like others reported within the Road River 'Group' in the region by Cecile (1980, pers. comm. 1982) who has named them the Marmot Formation. Most are Ordovician and Silurian and a few are Early Devonian. Conodonts collected from calcareous black shale in and beneath the volcaniclastic rocks in the MacMillan Fold Belt are early Middle Devonian making them the youngest known within the Road River Group.

Lower Earn Group (emDpt, muDpt, muDps, muDeg)

The Lower Earn Group includes four units. Two (emDpt, muDpt) are a siliceous or cherty facies and two (muDps, muDcg) are of clastic rocks. The clastic facies is thought to represent a turbidite fan complex (Carne 1979) derived from the west (Winn et al 1981) and is confined to the Central Block. The siliceous facies includes rocks that are older, time equivalent to, and younger than the clastic facies and is exposed in all blocks.

Unit emDpt, the oldest within the Lower Earn Group is exposed within the North and Central Blocks. In the North Block, 200 m of dark blue-grey weathering thin-bedded chert, argillite and shale are exposed. These rocks resemble those of the lower division of the Road River 'Group', but weather to darker colours and can be distinguished by the presence of bedded barite or plant fragments. Unit emDpt is gradational with silty limestone of the underlying Road River Group over a 10 to 20 m interval in which thick beds of grey clastic, crinoidal limestone are interbedded with black shale.

Bedded barite occurs intermittently in one or more horizons. In most places the barite is less than a metre thick, but locally reaches 30 m. On the Cathy Property, the most notable occurrence, barite is interbedded with, and replaces lenses of massive grey limestone up to 30 m thick. Thick limestone horizons are unknown elsewhere within the unit.

In the west and central parts of the Central Block, unit emDpt is less than 5 m thick and is absent in most places. The abrupt thickness change is attributed to an unconformity beneath the overlying clastic rocks of unit emDps but facies changes with both under- and overlying rocks cannot be discounted.

The oldest conodonts from limestone near the base of unit emDpt are mid-Emsian. Givetian conodonts were obtained from barite on the Cathy Property by Dawson (in prep). Upper age limits are provided by Frasnian fossils from overlying units.

Unit muDps comprises the finer size fractions of the turbidite fan complex and includes units 1 and 3a of Carne (1979). It weathers brown and most rocks are dark grey "pinstriped" shale and silty shale. Chert quartz sandstone and grit are minor constituents concentrated in the upper part of the unit. The sandstone and grit are locally graded and display flute and groove casts.

Thickness changes are abrupt and profound. In the western half of the Central Block the unit varies from 0 to 50 m, but in the eastern half from 50 to 300 m.

Unit muDps overlies units emDpt, SDv and OSDpt sharply and unconformably. Fossils have not been obtained, but it is bracketed by fossiliferous units above and below which indicate it is late Middle or early Late Devonian.

Unit muDcg is a resistant, massive, grey weathering chert pebble conglomerate that is equivalent to unit 2 of Carne (1979). The conglomerate is remarkably uniform and contains rounded to angular pebbles and cobbles of grey, black, white or green chert and minor quartz sandstone in a clean matrix of quartz and chert sand. Contacts with enclosing rocks are sharp. Hand specimens and outcrops are massive and structureless, but the unit may be made up of a coalescing series of separate debris flows. The size and extent of individual flows is difficult to determine, because weathered surfaces are covered by lichen. The conglomerate forms a single regionally mappable horizon, 0 to 50 m below the top of unit muDps. Conglomerate mapped about 4 kilometres north of the Jason Property may be stratigraphically lower than most of unit muDcg, although repetition of strata by a fault is possible. Small conglomerate lenses less than a kilometre long and 15 m thick occur above the main horizon within tan and silver weathering shale, along the southern margin of the South Block 17 km west of the Jason Property (Section G-I). Breccias containing angular fragments of black cherty argillite and chert in a muddy matrix are reported (Winn et al 1981) stratigraphically above and below unit muDcg on the Jason Property. These breccias are interpreted to be slumps derived from the scarp of an active fault nearby.

Unit muDcg varies in thickness from 10 to 300 m. It is thickest along the northern margin of the Central Block and thinnest along the southern margin.

The conglomerate underlies most of the Central Block, but depositional limits are uncertain. The unit is missing in the southeast corner of the map area and south of the Jason Property, and its absence elsewhere within the South Block is suggested by its thinness along the south margin of the Central Block. Along the northern margin of the Central Block, the conglomerate pinches out along section A-D. Elsewhere, the boundary is erosional, but the present limits may coincide with original depositional boundaries because a thick, competent unit like the conglomerate is unlikely to have been eroded from the North Block where older, less competent Middle Devonian shale and chert (emDpt) are preserved. Also, the abrupt change in style of deformation at the boundary is likely to reflect a difference in strata across it (Devonian conglomerate on southside) and/or a Devonian fault which could have influenced sedimentation.

The clastic facies of the Lower Earn Group (muDps, muDcg) may represent a single, elongate east-trending fan complex if present limits of exposure approximate depositional limits (Figure 5). In this interpretation the thick eastern parts of the finer-grained clastic rocks (muDps) represent the mid fan facies of the complex and the coarse clastic rock (muDcg) units proximal or channel facies. A westerly source is indicated by this facies configuration and because appropriate source rocks are more extensive west of the map-area than elsewhere. Easterly current directions reported by Winn et al (1982) from the finer grained clastic rocks on the Jason Property support this hypothesis.

Unit muDpt is equivalent to unit 3b of Carne (1979) and includes strata that overlie, and are lateral facies equivalents of, the clastic facies of the Lower Earn Group. In the Central Block, silver to blue-black weathering platy, graphitic, siliceous mudstone, siliceous shale and local chert sharply overlie the clastic facies (muDps, muDcg). Although similar to emDpt the mudstone weathers to more silvery colours and is less siliceous. Thicknesses range from 10 to 300 m and are greatest in the middle of the Central Block.

In the South Block, unit muDpt represents the Lower Earn Group and is in part time equivalent to strata of units muDcg and muDps. South and west of the Jason Deposits, light brown to silvery brown weathering black graphitic siliceous shale and silty shale makes up the lower half of the unit and silver to blue weathering black graphitic siliceous shale makes up the upper half for a total thickness of about 200 m. In the extreme southeast corner of the area mapped, a similar sequence is about 350 m thick. There, the lower division of light brown weathering, dark grey to black slate and minor siltstone appears to interfinger with the upper division of blue weathering siliceous shale and cherty argillite. The interfingering may be structural.

The lower brown weathering silty division in the South Block is probably equivalent to units muDcg and muDps. These rocks are included within Unit muDpt because they are most similar to the siliceous or cherty facies of the Earn Group and cannot be mapped separately.

Barite occurs intermittently near the top of unit muDpt in beds less than one meter thick. The lateral extent and continuity of these beds is uncertain.

Conodonts were collected from rare thin beds of platy coarse-grained black limestone in three localities within unit muDpt. Two of these collections are within 5 m of the top of the unit. One is Early Frasnian and the other is Middle Frasnian. The third, an unknown distance from the top, is Middle Frasnian.

This difference in age, and regional (Gordey et al, in press) and sedimentological evidence (Carne 1979) indicate that the upper contact of the Lower Earn Group is unconformable. The unconformity may account for some of the thickness variation of unit uDpt in the Central Block.

Upper Earn Group (Mps)

The Upper Earn Group (Mps) includes three distinct subdivisions. The lowest, equivalent to unit 4 of Carne (1979), comprises resistant dark brown weathering, thin- to medium-bedded ripple crosslaminated and plane parallel laminated sandstone and siltstone with silty slate. Thickness varies from 135 m at the east end of the map-area to more than 450 m southwest of the Jason property. Cross lamination disappears as the sandstone becomes shalier and poorly bedded going westwards and was not observed west of Cross-Section A-D.

In the eastern part of the map-area, the ripple cross laminated division is overlain by a middle division of blue weathering, well bedded black slate 150 m thick. In the same area, the upper division consists of brown weathering well bedded black slate and silty slate more than 150 m thick. Recessive, poorly exposed blue and brown weathering black silty shale underlies a large part of the west end of the South Block and may be equivalent to either or both the upper and middle divisions.

An unconformity at the top of the Upper Earn Group is indicated by regional evidence (Gordey et al, in press) and locally by absence of the middle and upper divisions beneath upper Mississippian quartz arenite at the west end of the Central Block.

Conodonts collected from a 1 m thick limestone at the top of the middle division in the southeast corner of the map-area are Visean. This age and constraints provided by younger and older units indicate the Upper Earn Group is Mississippian. It may also range into the latest Devonian.

Strata here included within the Lower and Upper Earn Group have been correlated by previous workers (Blusson, in Dawson, 1977, Carne 1979) with the Canol and Imperial Formations. This change in terminology has been proposed by Gordey et al (in press). The term Earn Group was formally introduced by Campbell for Devono-Mississippian strata in Glenlyon map-area (105 L) that are similar in lithology and age to those included within the Earn Group near MacMillan Pass.

Csp, Cq, Cl

The Upper Earn Group is unconformably overlain by an unnamed quartz arenite, sandstone, siltstone, shale and limestone sequence (Csp, Cq, Cl) 550 m thick. Brown weathering grey shale and silty shale, (Csp) which make up most of the unit can not be distinguished from parts of the Upper Earn Group, and the base of the sequence is mapped as the lowest quartz arenite. The quartz arenite is clean and well sorted, but grades to quartz sandstone with a dirty brown matrix. The quartz arenite and sandstone form well defined beds 30 cm to 30 m thick. Most are massive and structureless, but some thinner beds display flame structures and graded bedding.

In the Central Block, the unit includes grey to cream weathering, thick-bedded to massive limestone with abundant crinoid, coralline and shelly debris (Cl). The limestone is 300 m thick and is near the top of the sequence beneath an upper 20 m thick quartz arenite. The limestone is absent from the South Block and may change to shale there.

In the South Block, quartz arenite and sandstone are interbedded with shale in intervals up to 50 m thick at the base, near the middle and near the top of the sequence. Most finer-grained rocks are poorly exposed, brown weathering, thin-bedded, dark grey silty shale but the lower 50 m comprises dark blue grey siliceous shale and cherty argillite. In the north part of the South Block, the three sandstone intervals are missing or thin and the finer-grained strata of unit Csp are not distinguished from those of the Upper Earn Group.

Conodonts from the limestone member of unit Cl are Chesterian and from underlying sandstone are late Visean. Regional correlation (Gordey et al, in press) indicates that the limestone is diachronous and ranges into the Pennsylvanian. Underlying and overlying units restrict possible assignments of units Csp, Cq and Cl to late Mississippian and Pennsylvanian.

Ppt

Resistant, orange brown weathering, thin- to medium-bedded green shale and chert more than 200 m thick (Ppt) underlie small parts of the South Block. The base of the unit is in sharp contact with older strata and comprises more than 50 m of green shale. Chert is common within the upper part of the unit.

Fossils were not obtained from the unit, but similar strata described by Gordey (1981) have yielded Permian fossils from limestone at the base of the chert. Gordey has included chert-bearing strata with the Fantasque Formation and underlying green shales with older unnamed Carboniferous strata equivalent to unit Cps. This division is not possible near MacMillan Pass where the green shales are like those interbedded with chert, but unlike the grey shales assigned to unit Cps.

Ꞧ s

Recessive, dull brown weathering thin-bedded to thinly laminated calcareous sandstone, siltstone and shale (Ꞧ s) that is considered Triassic underlies a small area within the South Block. Distinctive ripple crosslaminations less than 5 m thick are characteristic of the sandstones. Contacts are either covered or faulted, but the sequence exceeds 300 m in thickness.

Fossils were not obtained from the unit, but similar rocks in Nahanni map-area are Triassic (Gordey 1981). There, the Triassic rocks unconformably overlie Permian strata.

STRUCTURAL GEOLOGY

The North, Central and Southern "Blocks" of the MacMillan Fold Belt are characterized by structural styles that are as distinctive as their Devonian stratigraphy. Boundaries between blocks that are defined by stratigraphic differences generally correspond to those outlined by changes in deformation. The boundaries are sharp west of the Canol Road but more diffuse east of it.

In the North Block, closely spaced southerly directed imbricate thrust faults are the dominant structures. The faults trend north of east, dip moderately to steeply north-northwest and intersect the rib of chert conglomerate (muDcg) at the southern boundary of the block at acute angles. The amount of stratigraphic throw (and therefore displacement?) decreases to the west along each fault. At their western end, the faults tend to steepen and/or die out in the cores of tight anticlines. Bedding consistently dips north northwest and intersects thrusts at low angles. The thrusts bring rocks as old as Cambro-Ordovician and locally the "Grit Unit" (COpt) on to Early and Middle Devonian (emDpt) rocks with a probable stratigraphic omission of 1 km. The thrusts apparently cut strata at a constant angle and do not preferentially follow specific horizons. A detachment surface on which the thrusts root may be present, but has not been identified. If specific detachment surface(s) exist, it (they) must be within the "Grit Unit" or older strata. Tight to isoclinal upright folds become prominent at the western and eastern ends of the North Block.

Within the Central Block, tight upright folds, high angle northerly directed reverse faults and irregularly oriented steeply dipping faults, some with unknown directions of throw, are typical. Folds in the western half trend west-northwest parallel to the MacMillan Fold Belt. At the east end, two sets of folds are superposed. Best developed and most extensive is a set that trends east-northeast; the other trends northwest. The second set appears to be the younger and consists of several large scale, open structures. The folds involve rocks as young as Mississippian and there is no evidence to indicate that the two sets of structures represent separate, unrelated periods of deformation.

High angle reverse faults appear to be geometrically and genetically related to the large scale folds. Most have small displacements relative to the lower angle southerly directed thrusts within the North Block.

Steep dipping faults occur throughout the Central Block in a variety of orientations. The faults cut the folds and reverse faults, and most are probably younger, but some appear to have influenced the development of these structures. In other words, folds on either side of some faults are not just offset, and cannot be matched across the normal fault. Thus folding may have proceeded independently on either side of a preexisting fault. These structures are best developed about 5 kilometres north of the Tom Deposit. They may be Devonian structures but are more likely tear faults that developed during later deformation as a result of abrupt variations in thickness of Devonian strata.

One fault that may have a Devonian component of movement is located on the Jason property along the boundary between the South and Central Blocks. There is no direct evidence, but the location and abrupt change in Devonian strata across it are compelling.

Within the South Block, large scale, tight, slightly northeast verging, northwest trending folds are characteristic. Normal faults that cut the folds are more systematic and less common than those within the Central Block. The faults are younger than, and unrelated, to the folds.

Most or all of the structures within the MacMillan Fold Belt appear to be related to regional Jura-Cretaceous deformation, but the marked contrast in structural style within the belt and coincident changes in Devonian stratigraphy indicate that deformation was influenced by Devonian faults. Faults rather than folds are probable because there is no local or regional evidence for Devonian folding, and strata within both the upper Road River and Lower Earn Groups could have been deposited within a rift or block faulting environment.

The complex and irregular structural pattern of the Central Block, in contrast to the relatively simple patterns of the North and South Blocks, indicates that Devonian faults are confined to it. Structure is complex throughout the Central Block, therefore it is probably composite and not just fault-bounded.

BARITE-LEAD-ZINC-SILVER DEPOSITS

Five sedimentary exhalative barite-lead-zinc-silver deposits are known within the Central Block on the Tom and Jason Properties. The deposits are described by Carne (1979) and Winn et al (1981) and were visited by the writer, but not examined in detail. At the Tom Property, the West and East Zones are exposed within a southerly plunging anticline. The West Zone is situated on the west limb of the anticline at the contact between sandstone and silty shale of unit muDps (unit 3a of Carne) and overlying blue weathering graphitic mudstone of unit muDpt (unit 3b of Carne). The East Zone is within the core of the anticline. Underground exploration of the zone, during the past winter, has revealed that the hanging wall and footwall are steep north-trending faults. Mineralization is similar to that at the south end of the West Zone. These exposures and drill information indicate that the East Zone probably is the faulted extension of the West Zone as originally proposed by Carne (1979).

Winn reports that the three Jason deposits are exposed within a zone of complex southeast-trending vertical faults and folds. All deposits trend southeast and dip steeply. The Main Zone occurs at the same stratigraphic level as the Tom West Zone, but the End Zone is situated at the base of unit muDps. The South Zone may occur in unit muDps below the chert conglomerate (muDcg), but could also lie at the same stratigraphic horizon as the Main Zone.

Carne (1979) and Winn et al (1981) propose that the base metal deposits were precipitated on the sea floor in quiescent basins near active faults. Slump breccias within host rocks near the Jason Deposits may be indications of such faults. Other structural or stratigraphic features unique to the Tom and Jason deposits are absent. A connection between the deposits and the unusual features of the Central Block as a whole is implied and probable, and until the relationship between stratigraphy, structure and mineralization is clear, the entire Central Block is a favourable exploration target. Exploration should focus on the Devono-Mississippian Lower Earn Group but not on a specific stratigraphic horizon.

SUMMARY

The variations in Devonian stratigraphy and style of deformation between the three blocks comprising the MacMillan Fold Belt suggest that the Central Block was a zone of faulting throughout much of Devonian time. Stratigraphic evidence for faulting includes:

1. Abrupt thickness changes between the North and South Blocks, within the Early Devonian, upper part of the Road River 'Group'.
2. Middle Devonian volcaniclastic rocks confined to the Central Block.
3. Truncation of thick Middle Devonian chert and shale beneath an unconformity(?) in the South and Central Blocks.
4. Confinement of Devonian turbidites and related clastic rocks to the Central Block.

Structural evidence for faulting includes: the unusual westerly trend of the MacMillan Fold Belt across the regional structural grain and the complexity of deformation within the Central Block in contrast to relatively simple patterns in bounding blocks. The fact that structures are complex throughout the Central Block implies that it is a composite feature and not simply fault bounded.

Devonian sedimentary exhalative massive sulphide deposits are associated with clastic rocks of the Lower Earn Group within the Central Block. Few sedimentary or structural features unique to the deposits are known and the entire Central Block is considered to be a favourable exploration target.

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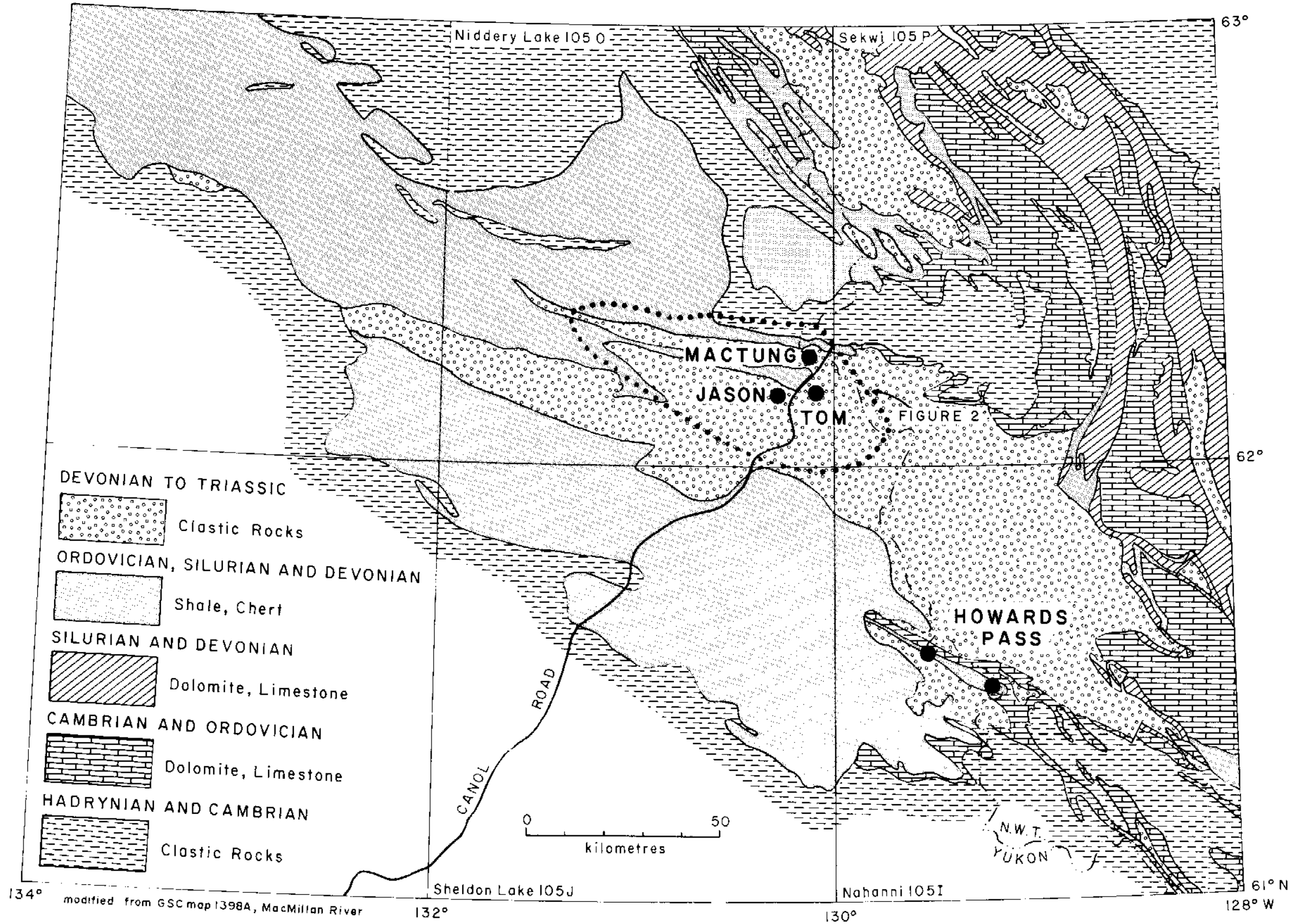

Figure 1
Location and geological setting of MacMillan Fold Belt.

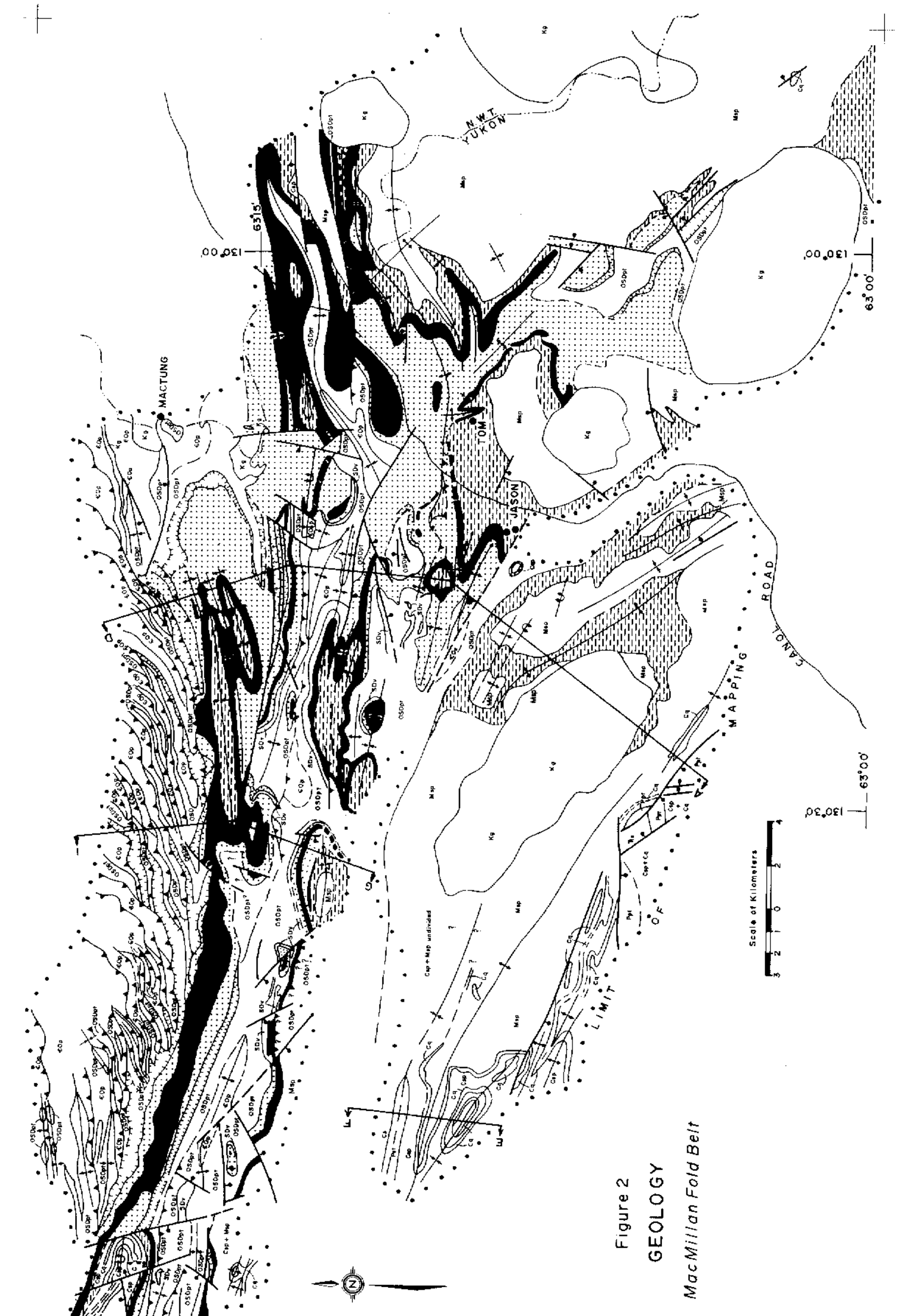

Figure 2
GEOLOGY
MacMillan Fold Belt

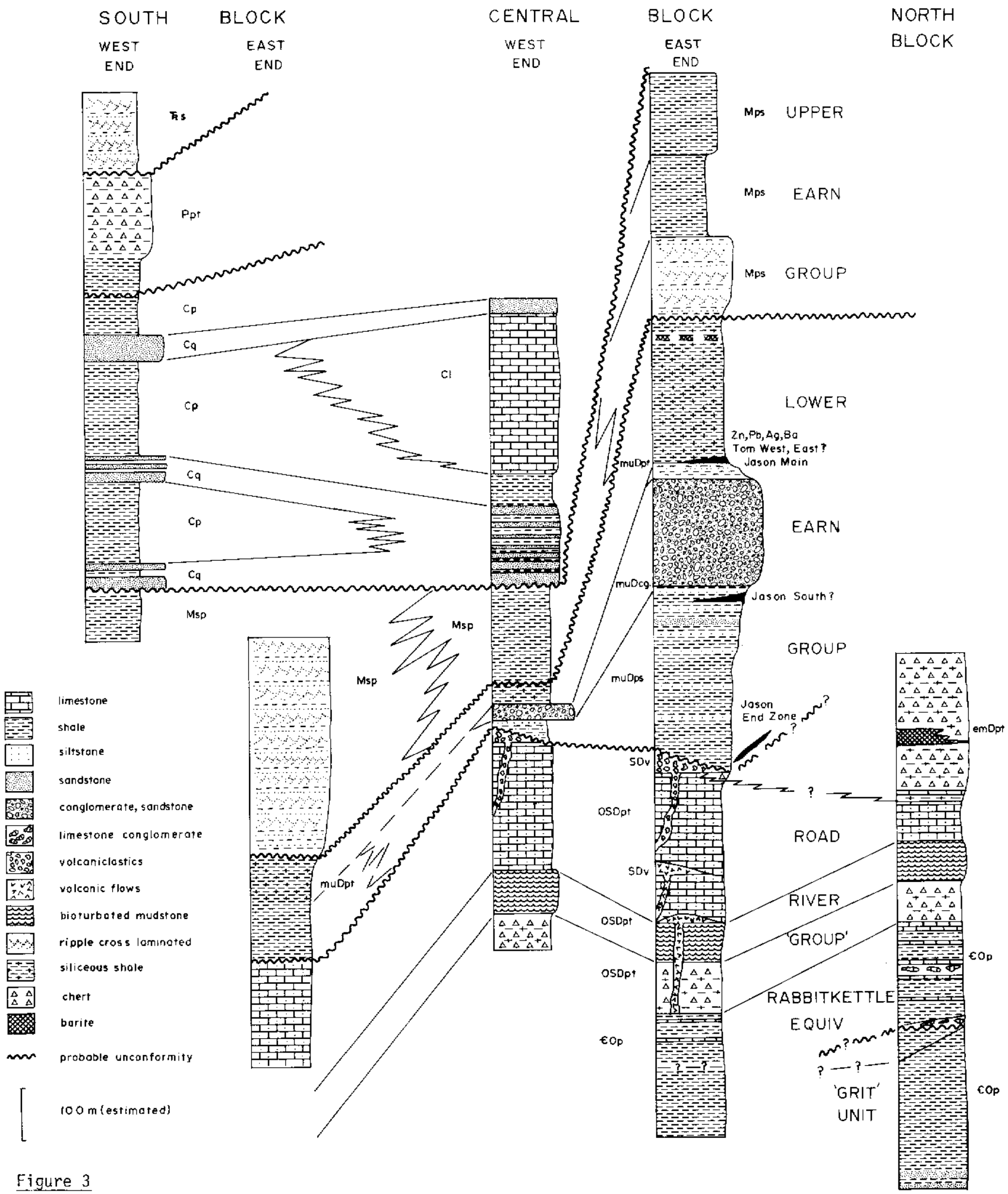

Figure 3
Structure Sections across the MacMillan Fold Belt.

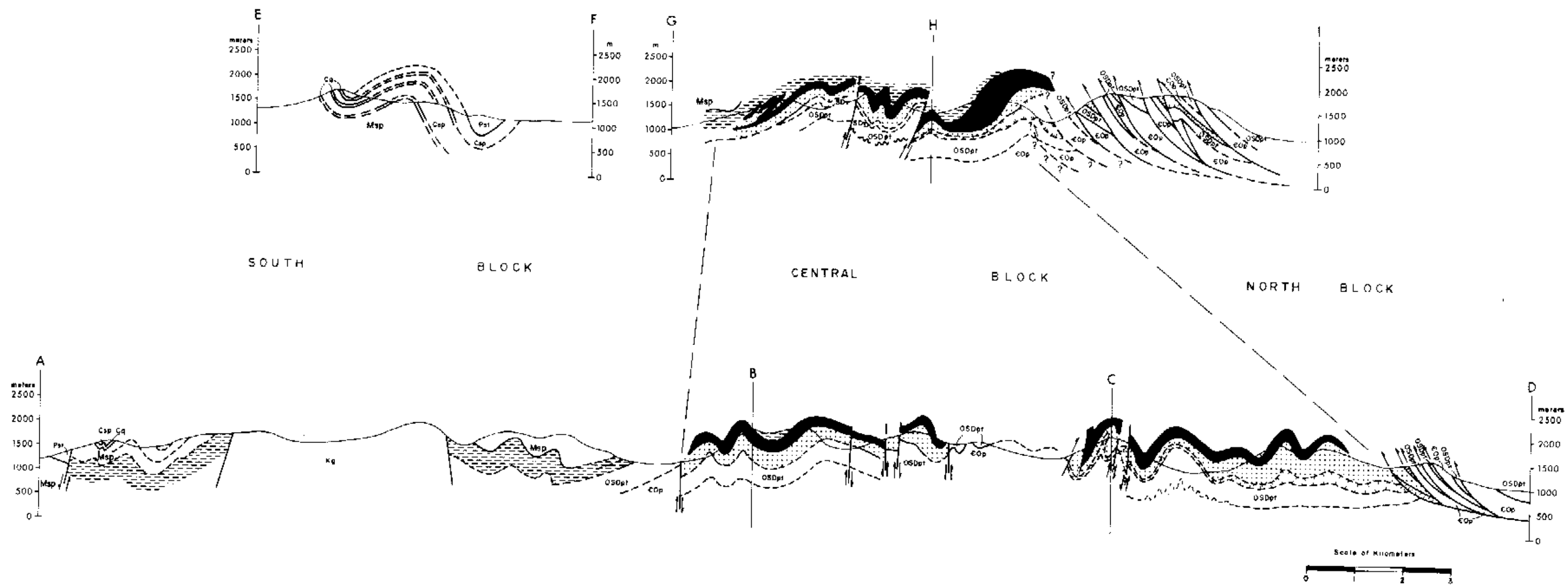

Figure 4
Idealized stratigraphic columns from different parts of MacMillan Fold Belt.

LEGEND
(To accompany Figures 2, 3 and 4)

CRETACEOUS

Kg - Resistant, blocky, grey weathering porphyritic to equigranular hornblende granodiorite, biotite quartz monzonite and biotite granite.

TRIASSIC

TRs - Recessive, dull brown weathering thin-bedded to thinly laminated calcareous sandstone, siltstone and shale.

PERMIAN AND (?) PENNSYLVANIAN

Ppt - Resistant, dark orange brown weathering interbedded greenish grey chert, cherty shale and recessive green shale.

CARBONIFEROUS

Cl - Grey weathering thick-bedded to massive bioclastic limestone; minor quartz arenite and shale.

Cq - Dark grey weathering massive quartz arenite and sandstone;

Csp - Recessive, brown weathering dark grey silty shale and shale, minor thin beds of sandstone.

MISSISSIPPIAN

UPPER EARN GROUP

Msp - Resistant, brown weathering, thick-bedded, ripple crosslaminated sandstone, siltstone and shale overlain by recessive blue weathering siliceous shale; in turn overlain by resistant dark brown weathering thin-bedded, dark grey shale and silty shale.

LOWER EARN GROUP (symbols)

muDpt - Talus forming, silver blue weathering, platy siliceous shale, minor chert and rare thin 2-5 cm thick beds of coarse-grained limestone and platy grey weathering barite in beds less than 1 m thick.

(?) MIDDLE AND LATE DEVONIAN

muDcg - Resistant, grey weathering resistant chert pebble conglomerate.

muDps - Brown weathering thinly laminated grey shale and siltstone with less chert, quartz sandstone and grit.

EARLY AND MIDDLE DEVONIAN

emDpt - Black to dark blue weathering thin-bedded chert, cherty argillite and siliceous shale. Light grey clastic limestone in beds 1 m thick or less near base and intermittent barite up to 30 m thick in 1 or more horizons.

SILURIAN, EARLY AND MIDDLE DEVONIAN

SDv - Orange weathering, mafic alkaline volcaniclastic rocks, and minor related sedimentary rocks. Local blocky, resistant dark grey weathering coarse-grained mafic alkaline lava flows.

ORDOVICIAN, SILURIAN AND EARLY DEVONIAN

ROAD RIVER 'GROUP'

OSDpt - Upper Division; Buff to tan weathering platy, silty limestone.

- Middle Division; Orange to green weathering bioturbated, wispy laminated green shale and mudstone.

- Lower Division; Brown weathering, medium -bedded chert overlain by silver to dark blue weathering, thin-bedded black chert and siliceous shale.

(?) HADRYNIAN, CAMBRIAN AND ORDOVICIAN

€Op - Upper Division; (facies equivalent to Rabbitkettle Fm). Brown weathering, grey and green shale, limestone conglomerate and thin interbeds of grey clastic limestone. Orange and grey weathering, thick-bedded limestone less than 10 m thick occurs locally at the top.
Lower Division; Dark brown and grey weathering grey shale and silty shale; ("Grit Unit") Maroon, green and brown weathering shale, minor quartz grit and sandstone.

Geological contact, defined, approximate

Reverse fault

High angle fault with normal and/or unknown directions of movement

Syncline

Anticline

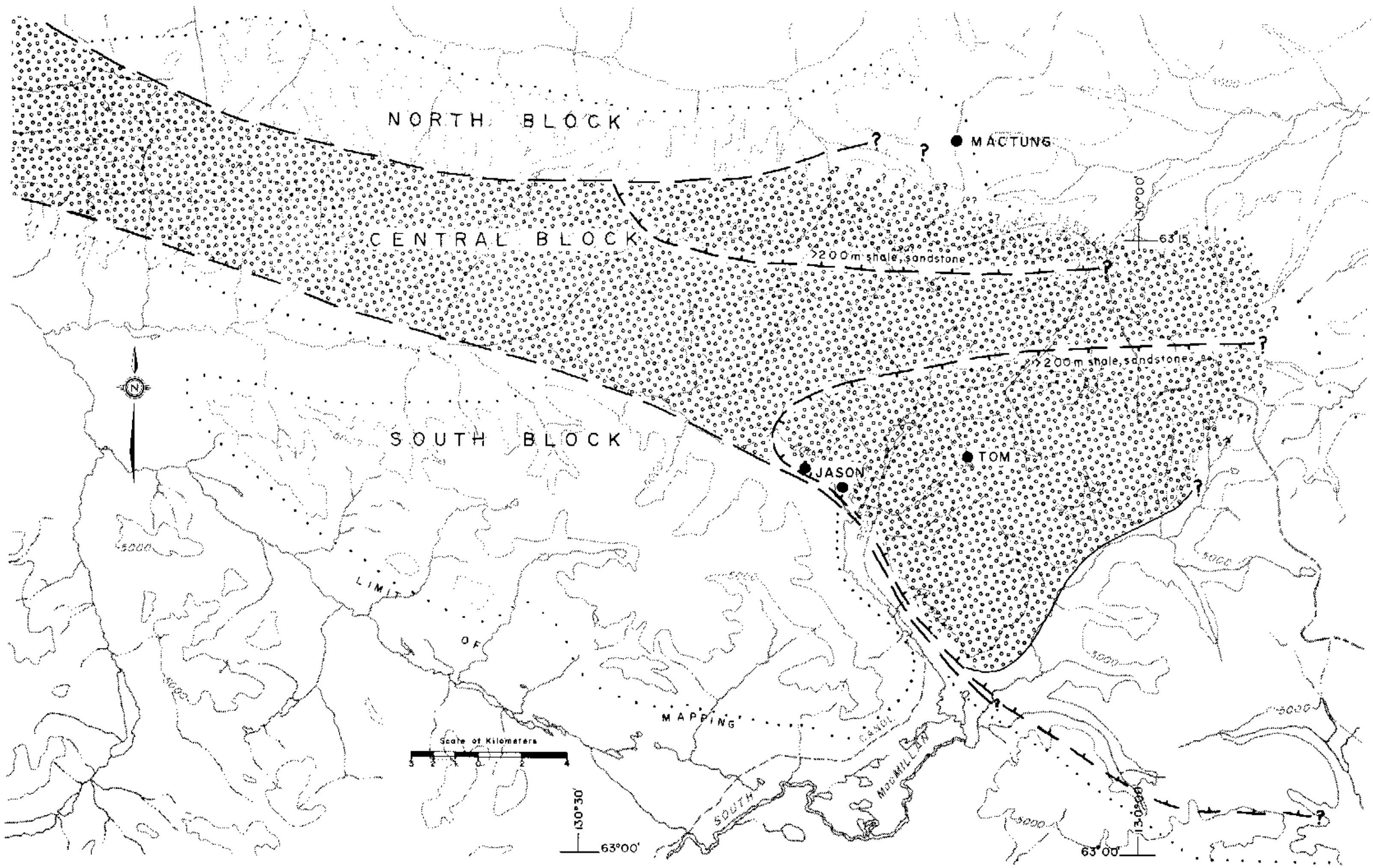

Figure 5

Approximate boundaries of the three blocks within MacMillan Fold Belt are shown by dashed lines. The Devonian submarine fan complex is confined to the Central Block. Small circles outline the present limit of exposure of chert conglomerate (muDcg). Known depositional limits are shown by a solid line. Finer grained clastic rocks (muDps) underlie the same area and extend farther southeast than the conglomerate. Hachured dashes outline areas where shale and sandstone are more than 200 m thick.

METAMORPHISM OF SEDIMENTARY ROCKS BY SYENITIC INTRUSIONS IN THE TOMBSTONE RANGE 116 A 4, YUKON TERRITORY

by

Paul Barrette
University of Ottawa

INTRODUCTION

The study area is located in the Tombstone Range, 70 km east of Dawson City, on the east side of Brewery Creek (see Figure 1). It covers four square kilometres and is occupied by a glacial cirque, the steep walls and ridge providing excellent rock exposures (see Figure 2). Purpose of the study is to investigate the metamorphism produced by the intrusion of syenite into sedimentary rocks. Fieldwork was conducted while the author was in the employ of Anaconda Canada Exploration Limited and the present report is a summary of a B.Sc. thesis completed by the author at the University of Ottawa in 1982. Previous work in the area includes regional geological mapping by Tempelman-Kluit (1970) and Green (1972).

GEOLOGY

Sedimentary and volcanic rocks ranging in age from Precambrian to Lower Cretaceous underlie the Tombstone area (Green, 1972).

The study area is underlain by a sequence of calcareous argillite and calc-silicate hornfels that consistently strikes in an east-west direction and dips to the south (Figure 3). Twenty kilometres to the northeast, near Antimony Mountain, similar rocks have been ascribed by Tempelman-Kluit (1981) to the Kechika Group of Cambrian, Ordovician and possible Silurian age.

The calcareous argillite is regularly layered and the bedding varies in thickness from a few millimetres to several centimetres (Figure 4). Calcareous clasts 1 to 5 cm in size are present and are responsible for a conspicuous differential weathering pattern resulting from a contrast in hardness between the more and the less calcareous layers (Figure 5). Calcite veins averaging a millimetre in width are common.

The calc-silicate hornfels is fine-grained and siliceous with distorted and irregular bedding (Figure 6). Colour of the fresh surfaces ranges from pinkish white, light to dark green and brown to dark grey. In thin section study, several mineral assemblages were recognized. Fine-grained subhedral tremolite, anhedral calcite and quartz occur along with subhedral to euhedral poikiloblastic scapolite up to a millimetre in size, containing diopside inclusions (Figure 7). Diopside also occurs in lenses, occasionally as megacrysts along with quartz. Layers of very fine-grained allotriomorphic granular biotite, chlorite and alkali feldspar are also typical assemblages. Subhedral interstitial muscovite occurs with lenses of granular quartz, feldspar, biotite and opaque minerals. Plagioclase and epidote have been identified by means of X-ray diffraction and probably occur in the very fine-grained portions of the specimens.

Samples of the calc-silicate hornfels and the argillite were collected along the ridge at the head of the cirque, and were analyzed with an X-ray diffractometer. Peak heights were used to indicate relative abundances of minerals (Figure 3).

The syenitic stocks are aphyric, medium-grained, and composed of 60% subhedral orthoclase, 25% mafic minerals (biotite, clinopyroxene, opaque minerals), 15% plagioclase and 5% anhedral quartz. Apatite and zircon are present in minor amounts as inclusions in the feldspars and the biotite, respectively.

The syenitic dykes range in thickness from 2 to 6 m. They are fine- to medium-grained and porphyritic with phenocrysts of orthoclase, plagioclase and biotite ranging in size from 0.1 mm to more than 2 cm (Figure 8). Orthoclase phenocrysts are the coarsest and they display Carlsbad twinning readily noticeable in hand specimen.

Several sulphide veins crosscut the intrusions and the host sedimentary rocks. They are less than a metre thick, and are rimmed by prominent orange-brown weathering zones extending 1 to 2 m on each side of the vein into the country rocks. The size of the metamorphic aureole suggests that the syenite bodies must be part of a much larger intrusion that probably underlies the study area.

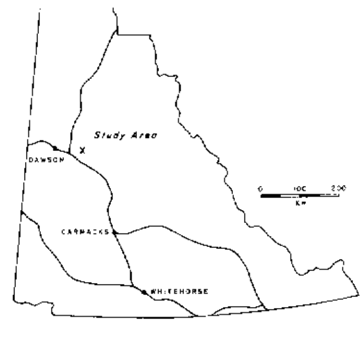

Figure 1

Location of the study area.

Figure 2

Wall of the cirque (more than 300 metres high) displaying dark coloured dykes running east-west.

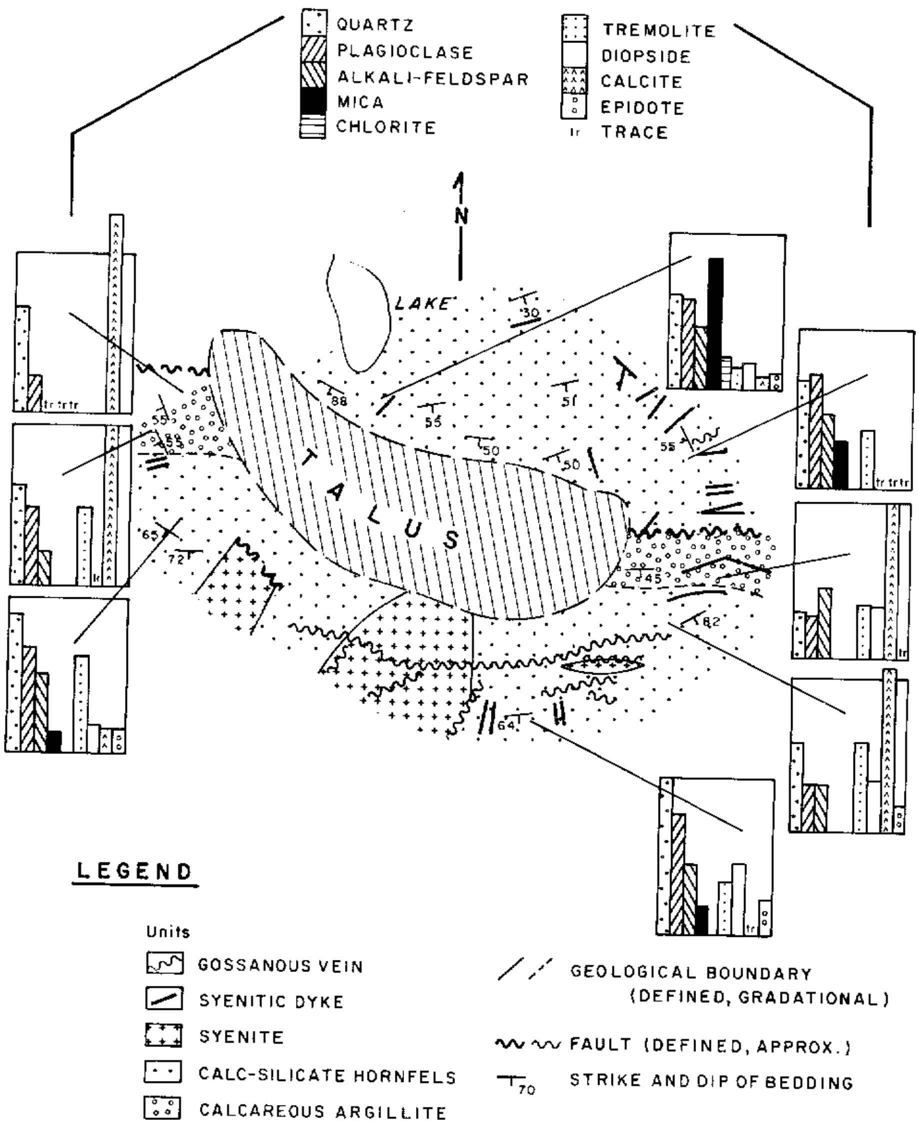

Figure 3

Geology of the study area and mineralogical variations of the sedimentary units. The histograms are the results of an X-ray diffraction analysis indicating the relative amounts of the main phases.

INTERPRETATION

An estimate of the conditions of metamorphism can be made by considering the stability fields of the main mineral assemblages in the calc-silicate hornfels. Figure 9 is a partial T-X $_{CO_2}$ diagram in the system Ca-Mg-Si-C-O-H showing the stability relationships of the phases occurring in these rocks (Einaudi et al, 1981). A low pressure environment of metamorphism with a maximum of 2 kb is indicated by several factors, including the porphyritic texture of the syenite and the regionally unmetamorphosed nature of the calcareous argillite.

The association of tremolite, calcite, quartz and diopside suggest that the conditions of formation are located along the boundary curve of the reaction

$$\text{Tremolite} + 3\ \text{Calcite} + 2\ \text{Quartz} \longrightarrow 5\ \text{Diopside} + 3\ CO_2 + H_2O \quad (1)$$

Hence, the inferred temperature of metamorphism is presumed to lie between 475° and 525°C.

The mineral investigation indicates that there is a definite zoning from the unmetamorphosed sedimentary rocks towards the main syenite bodies (see Figure 3). This zoning is characterized by a considerable decrease

Figure 4

Representative sample of the calcareous argillite.

Figure 5

Weathering pattern characteristic of the calcareous argillites and the transition zone between this unit and the hornfels.

in the calcite content and an increase in the amount of diopside, tremolite, quartz and feldspars towards the syenite. The variation in the amounts of quartz and feldspar, which are stable at these temperatures, may be attributed to their primary variation in the detrital quartzo-feldspathic sediments. The variation in the amounts of calcite and calc-silicate minerals can be explained by Figure 9, which shows that with increasing temperature, calcite and quartz react with dolomite to produce tremolite and diopside.

However, the zoning of metamorphic minerals may not necessarily be related to the thermal effects of the intrusions but rather to a variation in the initial content of dolomite in the sedimentary rocks before metamorphism. The absence of dolomite in the unmetamorphosed calcareous argillites may have effectively prevented the formation of the calc-silicate phases at higher temperatures. Although dolomite is stable at temperatures up to 570°C (Figure 9), the fact that it has not been identified in these assemblages suggests that the sediments were initially low in magnesium content. Thus, dolomite must have completely reacted with quartz to form talc which, in turn, was the limiting

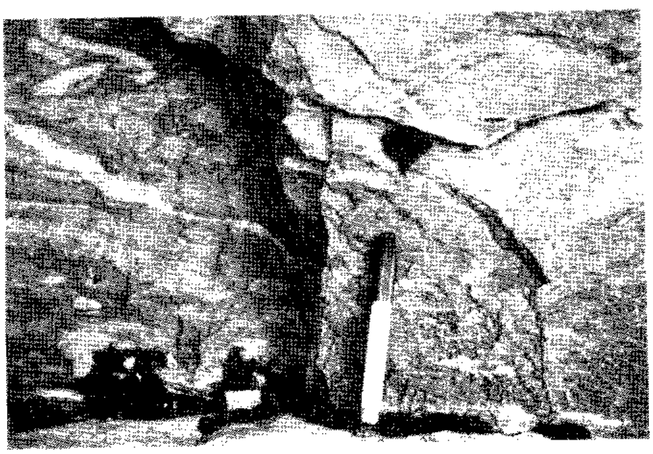

Figure 6

Calc-silicate hornfels displaying distorted bedding.

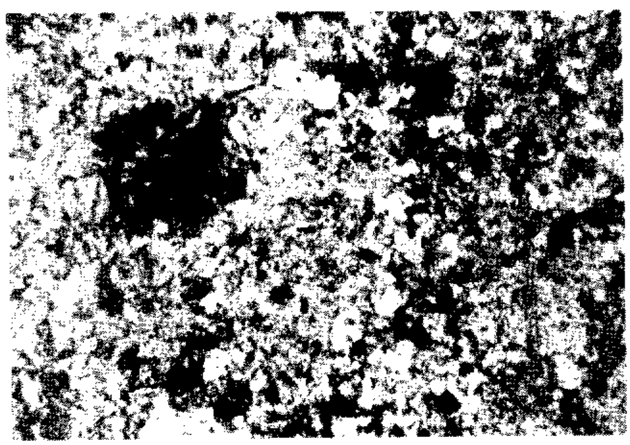

Figure 7

Photomicrograph of a typical assemblage present in the calc-silicate hornfels.

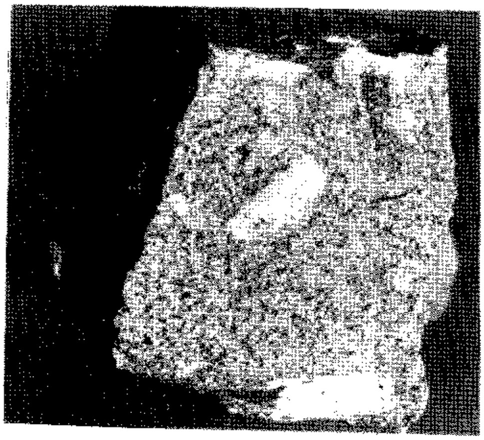

Figure 8

Sample of a syenitic dyke displaying orthoclase phenocrysts (approximately 2 mm) with conspicuous Carlsbad twinning.

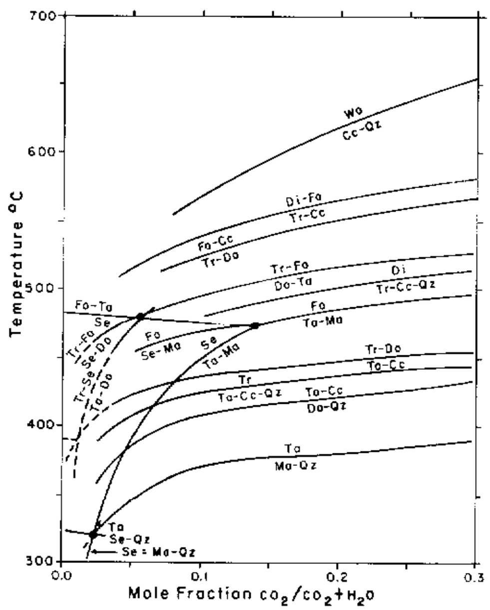

Figure 9

Partial T-X_{CO2} diagram for water-rich compositions in the system Ca-Mg-Si-C-O-H at 2 kb total pressure (modified after Einaudi et al., 1981). Abbreviations: Cc: calcite; Di: diopside; Do: dolomite; Fo: forsterite; Se: antigorite (serpentine); Ta: talc; Tr: tremolite: Wo: wollastonite.

phase in the reaction with calcite and quartz to produce tremolite. Consequently, dolomite could not have persisted to higher temperature.

CONCLUSION

The conditions of metamorphism of the sedimentary sequence underlying the study area are reflected by the stability field of the univariant assemblage tremolite-calcite-quartz-diopside. Assuming a pressure of 2 kb, the temperature of metamorphism lies between 475° and 525°C.

The mineralogical zoning displayed in the host rocks away from the syenite is interpreted as being essentially the consequence of a decreasing amount of dolomite in the original sediments.

ACKNOWLEDGEMENTS

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HEAVY MINERALS IN THE GRAVELS
OF HIGHET CREEK, YUKON TERRITORY,
115 P 9, 16

D.S. Emond
University of Ottawa
Ottawa, Ontario

INTRODUCTION

The Highet Creek area, 25 km northwest of Mayo, has been mined for placer gold continuously since 1903 by many individual operations (see Figure 1). Twenty-three samples, each 0.021 cu. m or 3/4 cu. ft., were taken from the main gravel units at seven stations along the creek (see Figure 2) and concentrated by using a small rocker box and then by panning. Light minerals were later removed by heavy liquid separation methods using methyl iodide (see Appendix 1).

GENERAL GEOLOGY (See Figure 2)

Geology of the McQuesten map area was mapped by Bostock (1964) at the 1:250,000 scale. Late Precambrian metasedimentary rocks of the Grit Unit, striking north-northeasterly, are intruded by high-level Late Cretaceous quartz monzonites (see Figure 2). An extrusive equivalent (quartz-latite) of similar or younger age is south of the study area. Skarn and vein mineralization is closely associated with the intrusions, and other rocks in the area consist of diorite, biotite andesite and lamprophyre.

GRAVELS OF HIGHET CREEK

There are three continuous gravel units along the creek: the lowermost Unit A - preglacial stream gravels; Unit B - glaciolacustrine silts and sands, and the uppermost Unit C - glacial till. Stratigraphic sections are shown in Figure 3 and their correlation in Figure 4. Characteristics of each gravel unit are described in Table 1.

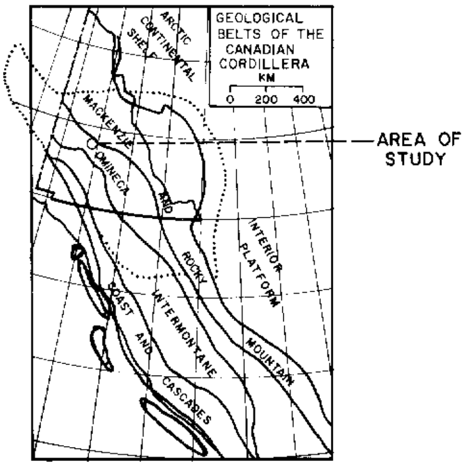


Figure 1

Location map for Highet Creek.

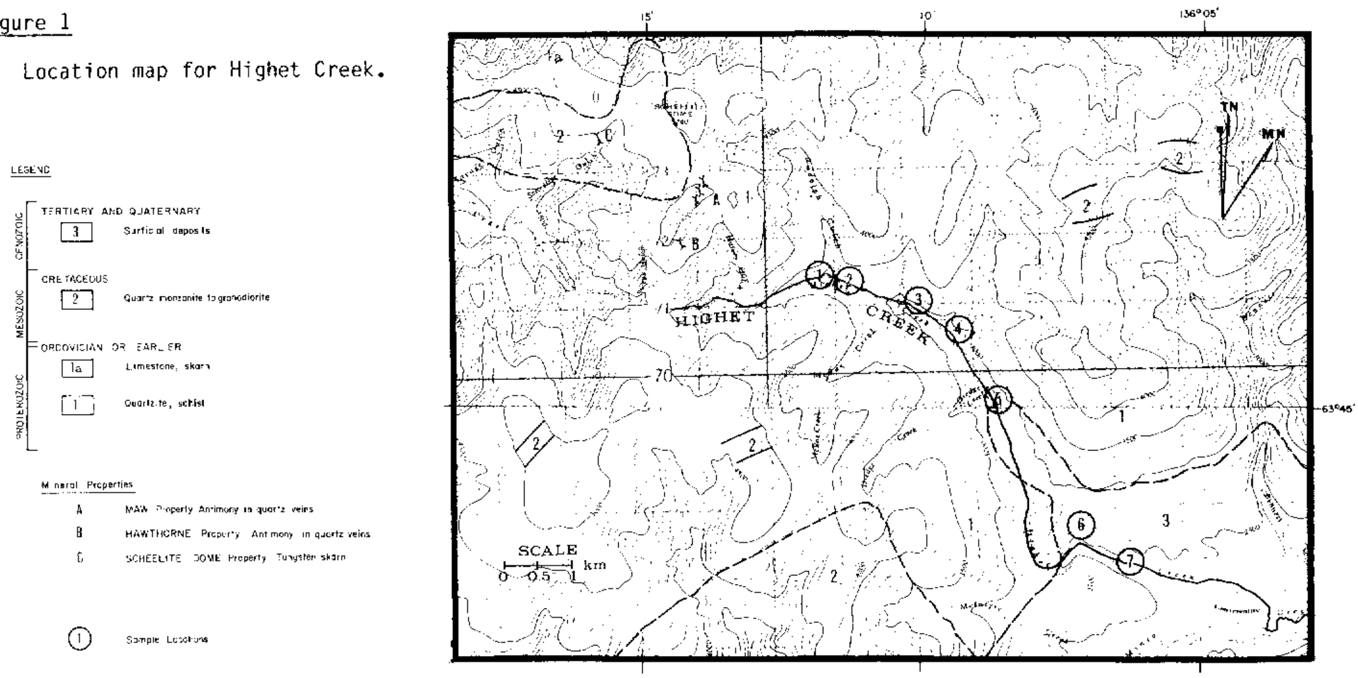


Figure 2

Sample locations and geology of Highet Creek.

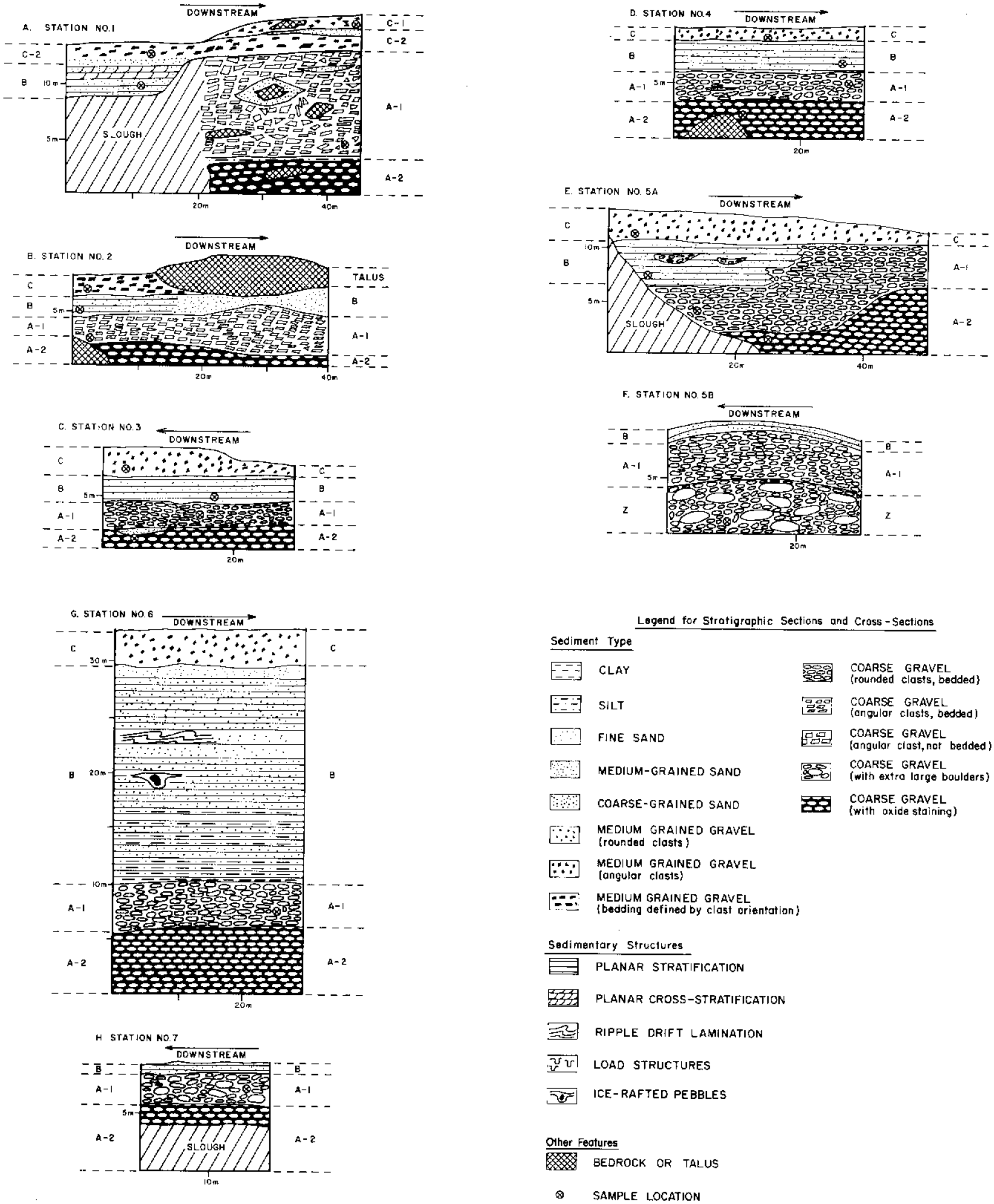


Figure 3

Stratigraphic sections of each station on Highet Creek.

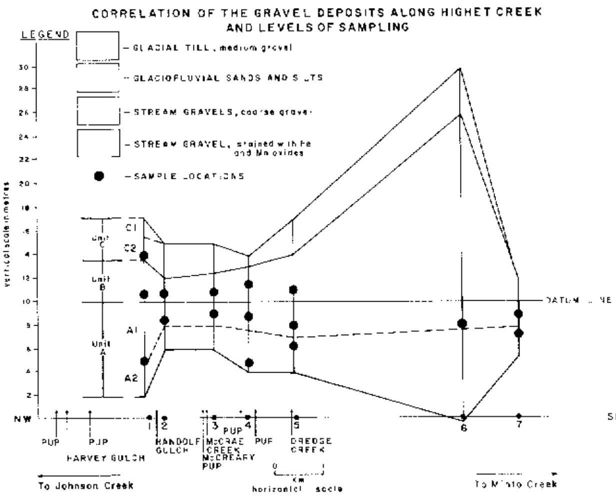


Figure 4

Correlation diagram.

Table 1. Comparison of Main Gravel Units

Characteristics	Unit A	Unit B	Unit C
Type of Sediment	coarse gravel	sandy silt	medium clayey gravel
Nature of Gravel	clast-supported		matrix supported
Clast Type	Schist, Quartzite, Granite, Diorite, Andesite		same as A plus erratics such as rhyolite, jasper, etc.
Matrix Type	medium sand to coarse gravel		clay to silt
Sorting	poorly sorted	well sorted	poorly sorted
Rounding of Clasts	variation going up-stream: well rounded to angular		variation going upstream: well rounded to angular
Lower Contact	bedrock-sharp (hummocky) surface)	Unit A - sharp	Unit B - sharp
Structures	bedding: indicated by parallel arrangement of slabby cobbles and pebbles	finely laminated, locally cross and ripple drift lamination, load structures, dropstones, graded units	very jumbled; no structures
Chemical Precipitates	MnO and FeO staining on Unit A-2 (the lower section of A)		
Origin of Gravel	pre-glacial stream gravel	glacio-fluvial silts and sands	glacial till, or boulder clay

Unit A was deposited during the late Tertiary when a very gradual but extensive uplift of the Yukon Plateau resulted in the cutting of deep channels and the rapid deposition of gravels (Cairnes, 1916). Gravels of this unit are immature (poorly sorted) and clast-supported with some large boulders up to 0.75 m in diameter. Orientation of clasts commonly defines a sub-horizontal imbrication. A very coarse gravel unit (Unit Z) underlies Unit A at station 5b, at the mouth of Dredge Creek. It seems to be part of a gravel fan formed at the mouth of this tributary, contains many huge boulders and shows no bedding, though in other respects, it is similar to Unit A.

Unit B was deposited in the Quaternary when a large glacier moved west up Minto Creek, and a lobe protruded up into the mouth of Highet Creek, damming the creek and forming a shallow lake in the valley. The resulting deposit, laminated silts and sands, contain other sedimentary structures such as cross-stratification near the head of the creek, and ripple-drift lamination, load structures, graded units and glacial drop stones near the mouth of the stream.

During the last stage of Wisconsin glaciation, the glacier advanced up towards the head of the creek before receding, leaving a layer of glacial till (Unit C). This unit consists of a matrix-supported gravel with a clay to silt matrix and multilith medium-sized clasts (up to 4 cm in diameter). No sedimentary structures are present.

Several gradual changes take place in the gravel units from the head of the creek to the mouth, including increases in the degree of rounding and the variability of clast-type. Near the head of the creek, most clasts are angular and are mainly mica schist, and there is also a lot of talus within the gravels, whereas further along the creek, clasts are rounded and are of many different rock types. Gold morphology also varies along the creek. Near the head of the creek, at station 1, most of the gold contained in gravel Unit A is highly crystalline in form. Sometimes the gold is hackly or dendritic, but it is always very angular. Downstream, the gold becomes gradually more rounded and somewhat flattened (see Figure 5).

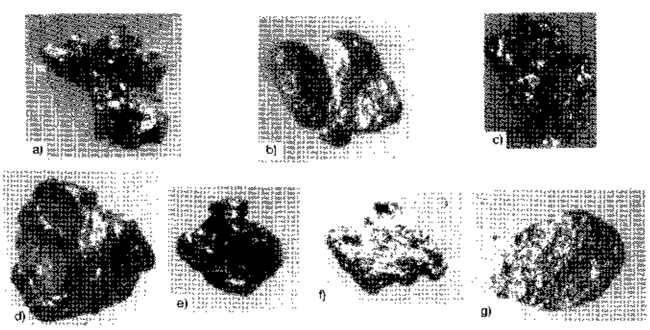


Figure 5 a-g

Variation in morphology of the gold along Highet Creek. At station 1 (Figure 5a,b,c), the gold is highly crystalline to hackly in form; at station 4 (Figure 5d) and 5 (Figure 5e), the gold is quite rounded. In the lowest part of the creek, at station 6 (Figure 5f) and 7 (Figure 5g), the gold is both rounded and flattened.

Table 2. Mineralogy of Heavy Concentrates

(values in weight percent of SG 3.3 heavies)

Station #	I				II			III				IV			
Mineral	A	B	C-1	C-2	A	B	C	A-1	A-2	B	C	A-1	A-2	B	C
Ilm	87.35	98.21	91.22	96.49	82.00	76.00	88.41	73.50	77.60	70.95	66.45	67.28	75.61	43.80	31.05
Goe	3.92	0.45	3.36	1.56	9.46	10.13	6.32	11.83	8.86	15.75	10.93	9.34	10.96	15.67	14.83
Hem	1.22	0.31	1.35	0.74	3.00	4.07	1.47	2.98	4.96	1.31	8.30	6.31	2.30	11.16	12.93
Leu	1.06	0.17	2.54	0.81	1.67	1.14	1.82	3.88	3.43	0.009	6.20	4.41	2.72	6.58	19.53
Mag	0.93	0.001	0.047	0.002	0.13	2.54	0.011	2.10	1.85	4.00	2.62	1.18	0.61	14.23	0.18
Gar	0.67	0.45	0.48	0.089	0.51	1.00	0.30	0.76	0.99	0.54	1.78	0.92	2.65	3.54	4.93
Staur	0.082	-	0.036	-	0.086	1.15	0.25	1.19	0.27	1.64	0.78	0.12	0.29	-	5.52
Cor	2.04	-	0.17	0.03	1.66	2.32	1.02	1.47	1.13	3.59	0.10	5.45	2.12	1.84	1.82
Rut	0.33	-	0.085	0.069	0.14	0.019	0.14	0.15	0.091	-	0.077	0.52	0.24	-	-
Zir	0.14	-	0.019	0.045	-	0.061	0.008	0.17	0.057	-	0.12	0.45	0.049	0.41	-
Sch	1.40	0.056	0.17	0.091	0.56	0.12	0.096	0.51	0.37	0.98	0.32	1.31	0.54	-	0.12
Tour	0.33	-	0.74	0.005	0.43	-	0.029	0.014	0.053	-	0.39	0.71	0.33	-	2.37
Chl	-	-	-	-	-	-	-	0.23	-	-	0.24	0.12	0.058	0.29	0.37
Spin	0.022	-	-	0.001	-	0.34	0.087	0.10	-	-	0.015	0.10	0.041	-	1.34
Hy	0.085	-	-	0.001	-	-	-	0.06	0.039	-	0.24	0.084	0.43	-	-
Diop	-	-	-	-	0.008	-	-	-	-	-	-	0.031	0.12	0.58	0.45
Aug	-	-	-	-	-	-	-	-	0.013	-	-	0.023	-	0.18	-
Trem	-	-	-	-	0.50	-	-	-	-	-	-	0.23	0.068	-	-
Act	-	-	-	-	-	-	-	0.15	-	-	-	0.031	0.51	0.18	-
Hbd	-	-	-	-	-	0.022	0.099	-	-	-	-	0.054	0.009	-	-
Sph	0.032	-	0.043	0.005	0.031	-	-	0.52	0.18	-	0.28	0.35	0.11	0.83	1.56
And	0.025	0.056	-	0.036	0.12	-	0.011	0.17	0.031	-	-	0.20	0.13	0.41	0.20
Mul	-	-	-	-	-	-	-	0.039	-	-	0.027	0.035	0.022	-	0.19
Ky	-	0.056	-	-	-	-	-	0.014	-	-	0.015	0.33	-	-	0.073
Ep	-	-	0.72	-	-	0.25	-	0.12	0.028	-	0.18	-	0.012	0.29	2.30
All	-	-	-	-	-	-	-	-	-	-	-	0.031	0.069	-	-
Bi	-	-	-	-	-	-	-	-	-	-	-	0.031	-	-	0.20
Brk	-	-	-	-	-	-	-	-	-	-	-	-	0.009	-	-
An	-	-	-	-	-	-	0.019	0.014	-	-	-	-	-	-	-
Flu	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cel	-	-	-	-	-	-	-	-	-	-	-	-	0.009	-	-
Ferr	-	-	-	0.005	0.042	-	-	-	-	-	-	0.14	0.007	-	-
Asp	-	-	-	-	-	0.34	-	-	-	-	-	-	-	-	-
Py	-	-	-	0.002	0.014	-	-	-	0.009	-	-	0.01	0.013	-	-
Po	-	-	-	-	-	-	-	-	-	1.23	-	-	-	-	-
Cpy	-	-	-	0.005	-	-	-	-	-	-	-	0.046	-	-	-
Bor	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-	-	-	-	-	0.012	-	-
Stib	-	-	-	-	-	-	-	-	-	-	0.014	-	-	-	-
Ga	0.05	-	-	-	-	-	-	0.029	0.009	-	-	0.20	-	-	-
Mang	-	-	-	-	-	-	-	-	0.009	-	-	-	-	-	-
Pch	-	-	-	-	-	-	-	-	-	-	-	0.046	-	-	-
Scap	-	-	-	-	-	-	-	-	-	-	-	0.023	-	-	-
Gold	0.32	-	0.021	0.009	-	-	-	-	-	-	-	-	0.046	-	0.076

Table 2. (cont.).

(weight percent of SG 3.3 heavies)

Sta. #	V					VI	VII	
Mineral	Z	A-1	A-2	B	C	A	A-1	A-2
Ilm	30.61	78.38	75.83	40.87	26.54	77.83	37.30	37.57
Goe	23.81	12.48	6.53	15.40	11.18	9.24	13.35	11.26
Hem	9.35	1.17	2.65	10.99	19.89	5.28	14.40	10.94
Leu	2.65	1.89	2.52	6.93	14.63	1.49	7.56	3.96
Mag	21.30	0.68	4.74	10.92	0.72	0.32	7.49	2.55
Gar	2.11	0.81	2.08	6.46	7.80	1.18	4.78	6.46
Staur	4.21	0.48	1.11	4.66	8.07	0.17	3.29	8.71
Cor	0.90	1.89	1.14	0.49	1.20	2.86	4.32	3.66
Rut	0.071	0.95	0.16	-	0.045	0.18	0.084	0.24
Zir	0.087	0.34	0.14	0.055	0.11	0.13	0.17	0.32
Sch	0.085	0.11	1.41	0.52	0.15	0.20	0.34	0.12
Tour	0.48	0.16	0.05	0.31	1.23	0.098	0.67	3.57
Chl	-	-	-	0.15	-	-	-	-
Spin	1.26	-	-	0.62	3.73	0.20	1.20	7.30
Hy	0.48	0.088	0.079	0.15	-	-	0.72	0.03
Diop	0.42	-	0.35	-	0.75	0.13	0.36	-
Aug	0.32	-	-	-	-	-	0.36	-
Trem	-	0.044	-	-	-	-	-	-
Act	-	-	-	-	-	-	-	-
Hbd	-	-	-	-	-	-	0.36	-
Sph	0.97	0.31	0.032	0.87	2.91	0.31	1.98	1.81
And	-	0.13	0.031	0.32	0.045	-	0.17	-
Mul	-	-	-	0.12	0.17	0.19	0.047	0.34
Ky	0.058	-	0.028	0.037	0.045	-	0.064	0.056
Ep	0.16	0.24	0.025	-	0.48	0.13	0.79	0.09
All	-	-	-	-	-	-	-	-
Bi	-	-	-	-	-	-	-	-
Brk	-	-	-	-	-	-	-	-
An	0.027	-	-	-	0.076	-	-	0.047
Flu	-	-	-	0.018	0.045	0.013	-	-
Cel	-	-	-	-	-	-	-	-
Ferr	-	-	-	-	-	0.023	0.017	-
Asp	-	-	-	0.092	0.17	-	0.017	-
Py	-	0.045	-	0.018	-	-	0.082	-
Po	-	-	-	-	-	-	-	-
Cpy	-	-	0.025	-	-	-	-	-
Bor	-	-	0.87	-	-	-	-	-
Copper	-	-	-	-	-	-	-	-
Stib	-	-	-	-	-	-	-	-
Ga	-	-	0.14	-	0.015	-	-	-
Mang	-	-	-	-	-	-	-	-
Gold	-	0.045	0.056	-	-	0.026	0.084	0.003

LIST OF ABBREVIATIONS

act	actinolite	hem	hematite
all	allanite	hbd	hornblende
an	anatase	hy	hypersthene
and	andalusite	ilm	ilmonite
ars	arsenopyrite	ky	kyanite
aug	augite	leu	leucoxene
bi	biotite	mag	magnetite
bor	bornite	mang	manganite
brk	brookite	mul	mullite
cel	celsian	po	pyrrhotite
chl	chloritoid	pyr	pyrite
cor	corundum	pch	pyrochlore
cpy	chalcopyrite	rut	rutile
cu	copper	scap	scapolite
diop	diopside	sch	scheelite
ep	epidote	sph	sphene
ferr	ferritungstite	spin	spinel
flu	fluorite	stau	staurolite
ga	galena	stib	stibnite
gar	garnet	tour	tourmaline
goe	goethite	trem	tremolite
gold	gold	zir	zircon

Most of these features can be explained by normal stream action, but the variation in morphology of gold indicates that the source of most of the gold is near the head of the creek. The abundance of gold in the gravel is also much higher near the head of the creek, indicating that the major source is at the head of the creek, possibly related to the quartz-arsenopyrite -stibnite veins.

The lower 2 to 4 m of Unit A (A-2) is stained with manganese and iron oxides, whereas the upper part (A-1) is not. The boundary between these two is probably the water table for metal-rich oxygenated paleogroundwater which moved along the creek bottom and through the lower A-2 unit. This occurred after deposition of Unit A. Most of the gold in this unit has a high degree of crystallinity which indicates that the groundwater probably transported and reprecipitated some gold in the A-2 unit. The higher gold content of gravels lying closer to bedrock, (reported by the miners of the creek) also supports the theory of addition of gold to the lower gravels by groundwater.

HEAVY MINERALS IN THE GRAVELS

The laboratory-determined weight percents of each heavy mineral in the heavy mineral concentrates from all 23 samples are given in Table 2. Major minerals present in order of abundance are ilmenite, goethite, hematite, leucoxene, magnetite, garnet and staurolite ($\geq$1%). Minor heavy minerals present (0.1-0.9%) include scheelite, sphene, rutile, tourmaline, spinel, zircon, epidote, hypersthene and andalusite. Very minor minerals of the abundance 0.01 to 0.09% are diopside, gold, hornblende, kyanite, chlorite, augite, tremolite, mullite, galena, actinolite, ferritungstite, pyrite, chalcopyrite and pyrochlore. Trace amounts (0.001 - 0.01%) of allanite, biotite, scapolite, arsenopyrite, anatase, fluorite, bornite, brookite, native copper, manganite, celsian, pyrrhotite and stibnite are present.

Source rocks for these minerals are shown in Table 3.

Table 3. Heavy Mineral Contained in Rocks from the Highet Creek Area

Vein	Skarn	Schist	Quartz monz.	Diorite	Met. aureole
gold	diop	ilm	all	hbd	and
asp	ep	and	aug	hy	bi
bor	sch	chl	zir	mag	mul
cpy	po	ky	hbd	sph	cor
sch	cpy	bi	an	diop	
ga	scap	tour	br	py	
stib	ferr	rut	ilm	ep	
* an	trem	an	sph		
br	spin	br	bi		
rut	pch	gar			
tour	gar	py			
py	tour	mag			

* Note: Above line - minerals are most distinctive of one rock type.

Below line - minerals which may be present, but which may also occur in other rock types and are, thus not as distinctive of one rock type.

Table 4. Variation of Mineral Suites in the Vertical Section

Gravel Unit	Z	A-2	A-1	B	C
Skarn	ep, diop, gar, spin (tour, sph)	diop, sch, cpy, bor, spin, gar	ep, sch, ferr, trem, scap, pch	*(sph)	ep, spin (tour, sph)
Veins	(tour, an)	gold, sch, bor, ga, copper (rut, py, brk)	aspy, ga (rut)		(an, rut, tour)
Qz. Mon.	aug (sph)	all, zir (rut)	aug, zir (hbd, sph, rut, bi)		
Schist	staur, ky, hem, leu	ilm (rut)	ky, and, bi, leu	staur, and, hem	ky, leu, hem
Met. Au.		cor	cor, mul, and	and	mul
Diorite	hy, mag, sph	(zir)	hbd, hy, sph, act (zir)		
Alt. Min.	goe, hem, leu	cel, mang	goe, leu	goe, hem	hem, leu

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets denote the presence of that mineral in several rock types.

VARIATION OF MINERALOGY IN THE VERTICAL SECTION

Unit A-2 to Unit A-1

By studying the vertical variation in mineral abundances (see Figure 6, and Table 4) from the base in Unit A-2 upward into Unit A-1 at stations 3, 4, 5 and 7, several generalizations can be made. As expected, there is a decrease in the amount and presence of the manganese oxide alteration minerals such as manganite from A-2 to A-1. This is because the oxygenated groundwater carrying the manganese did not run through gravels of the A-1 unit. Some vein minerals, including gold and native copper, are more abundant in the A-2 unit. This is probably due to the effect of the oxygenated water which may have transported and precipitated some of these minerals. Morphology of the gold in the A-2 unit especially indicates this, as most of the gold is of a high degree of crystallinity showing very little abrasion.

There is an increase in most skarn minerals upward in Unit A. This could indicate further uncovering and approaching of the higher grade rocks as time went on and as the gravel was deposited. More minerals from the granite are present higher up in Unit A which probably indicates the increasing exposure of the pluton. Higher grade minerals from the schist and minerals from the diorite increase while the ubiquitous schist mineral, ilmenite, decreases in abundance. This indicates further uncovering of the metamorphic and dioritic rocks.

Unit Z

At station 5B, the gravel Unit Z, at the mouth of Dredge Creek is found to be different not only sedimentologically but also mineralogically from the overlying

VARIATION OF MINERALOGY IN THE VERTICAL SECTION

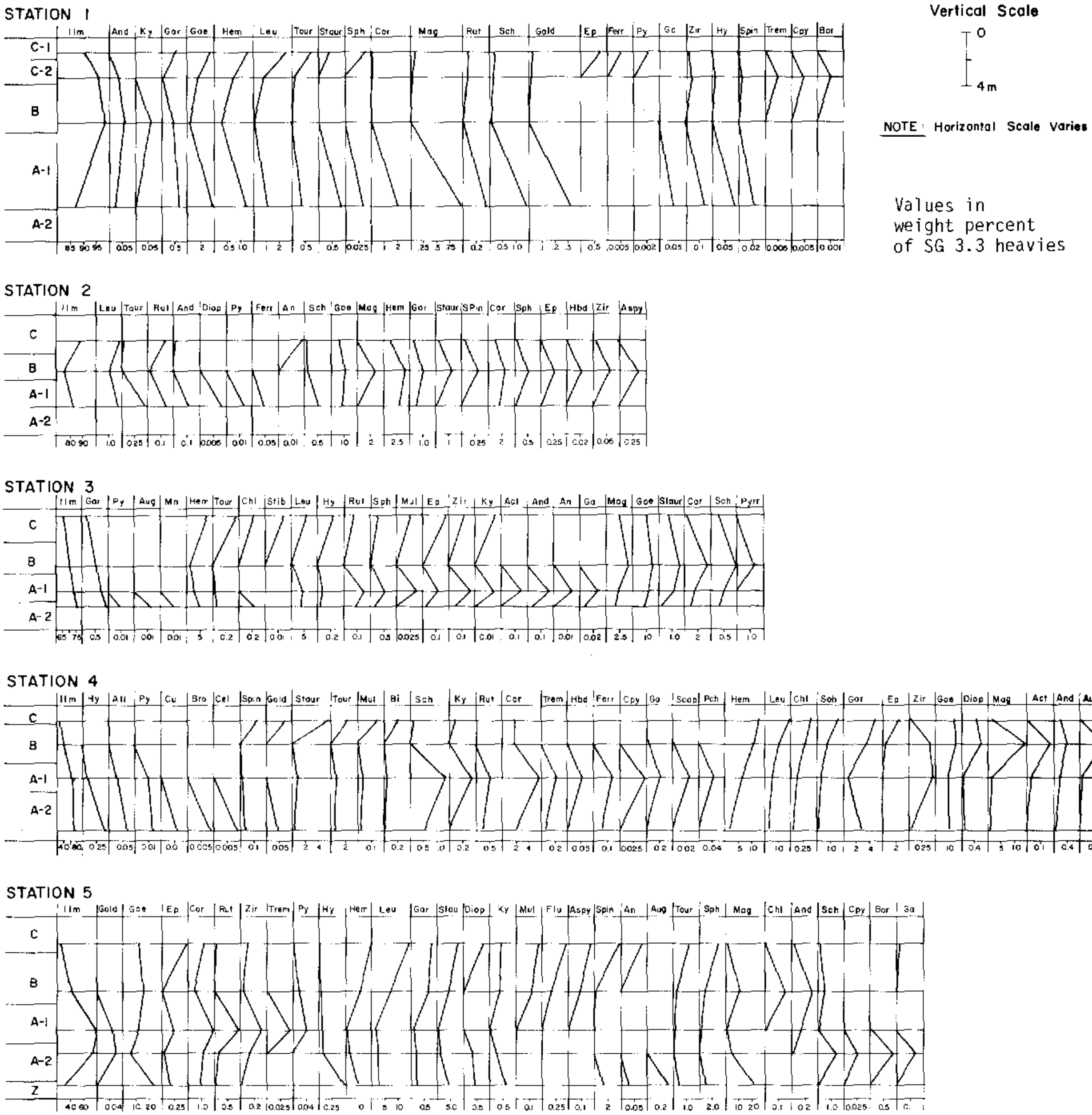


Figure 6

Variation of mineralogy in the vertical section

Unit A. Unit Z contains much more of the schist, diorite and alteration minerals while containing less high temperature vein and skarn minerals than Unit A. This indicates that when Unit Z was being deposited, much of the high temperature vein and skarn mineralization and the associated quartz monzonite pluton at the head of Dredge Creek had not yet been exposed by erosion. Only later, after stream gradients had been reduced, and more of the quartz monzonite was uncovered, did vein and skarn minerals become abundant in the stream gravels of Unit A.

Unit A to Unit B

Unit B has a very limited range of mineral species and the abundances of many mineral suites decrease drastically from Unit A to Unit B except at station 2. Only a few schist minerals and alteration minerals, such as goethite and hematite, increase in abundance. The decrease in vein, skarn, diorite and granite minerals indicates that these rock types were not as abundant in the source area of the glacio-lacustrine sediments as they were in the Highet Creek drainage basin.

Alteration of the iron minerals in Unit B occurred by the action of oxygen-rich glacial runoff, accounting for the higher goethite and hematite concentrations.

At Station 2, Unit B probably had a greater variety in mineral species due to mixing with stream sediments from Rudolph Gulch.

Unit B to Unit C

From Unit B to Unit C, there is a great increase in the variation and abundances of many mineral species at all stations. The mineral distribution is somewhat similar to that found in Unit A, indicating that most of the till in Unit C comes from local sources within the Highet valley. Further evidence of a largely local source is the high degree of crystallinity of the gold from this unit, reflecting the short distance of transport.

Unit C is subdivided into two subunits at station 1. The upper unit, C-1, carries more skarn, vein (including gold and scheelite), schist, and diorite minerals than C-2. This indicates more extensive uncovering of the mineralized zones associated with the granite between the deposition of C-2 and C-1.

VARIATION IN MINERALOGY ALONG THE CREEK

In the lateral sections in Figure 7 it should be noted that all of the samples within each unit were not taken at exactly the same level. Sampling levels within the gravel sections are shown on Figure 4. Elevation of the base of each section is seen on the sample location map, Figure 2.

Unit B and, to a lesser extent, Unit C contain large additions of glacial sediments from outside the Highet Creek drainage basin, and therefore, do not reflect local geology as clearly as does Unit A. For this reason, the discussion of variations in mineralogy along the creek is confined to Unit A. There is, however, a summary of mineral variations along the creek in Table 5.

Unit A-2

In Unit A-2, sampled at stations 3, 4, 5, and 7, ilmenite decreases steadily in the downstream direction, indicating that there is one major source area near the head of the creek consisting of mica schist, quartzite and minor amounts of granite. Ilmenite shows the same downstream trend in all other gravel units (A-1, B, and C).

From station 3 to 4 there is an increase in many skarn, and high temperature vein minerals, such as scheelite and gold, along with some schist and diorite minerals (see Figure 7 and Table 6). Galena, a medium temperature mineral, disappears, and a few other minerals, such as epidote, zircon, and magnetite decrease in abundance. At station 5, several skarn and high temperature vein minerals such as bornite, scheelite, chalcopyrite and gold increase. At station 7, most

Table 5. Similarities of Mineral Variation in Gravel Units along the Creek.

Station No.	A-2	A-1	B	C
		Gravel Units		
1	No sample	Vein Skarn *(Met. Au., Qz. Mon., Diorite)	Schist (Skarn (sch))	Vein Skarn (Diorite)
2	No sample	Schist (Skarn)	Skarn Diorite (Vein (asp))	(Schist, Skarn)
3	(Vein (ga))	Schist Diorite (Skarn, Met. Au., Vein (ga))	Skarn	Schist Diorite Skarn
4	Skarn Vein Met. Au. (Diorite, Schist, (Qz. Mon.)	Skarn Vein (Diorite, Qz. Mon., (Schist))	Skarn (Schist, Met. Au., Diorite, Qz. Mon.)	Skarn Schist (Vein (gold)
5	Skarn Vein	Skarn (ep) Vein (gold)	Skarn Vein (Schist)	Skarn Vein
6	No sample	(Skarn)	no sample	no sample
7	Skarn Schist (Qz. Mon., Met. Au., Vein)	Skarn Vein Diorite Schist Qz. Mon. (Met. Au.)	no sample	no sample

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets indicate less prominent increases.

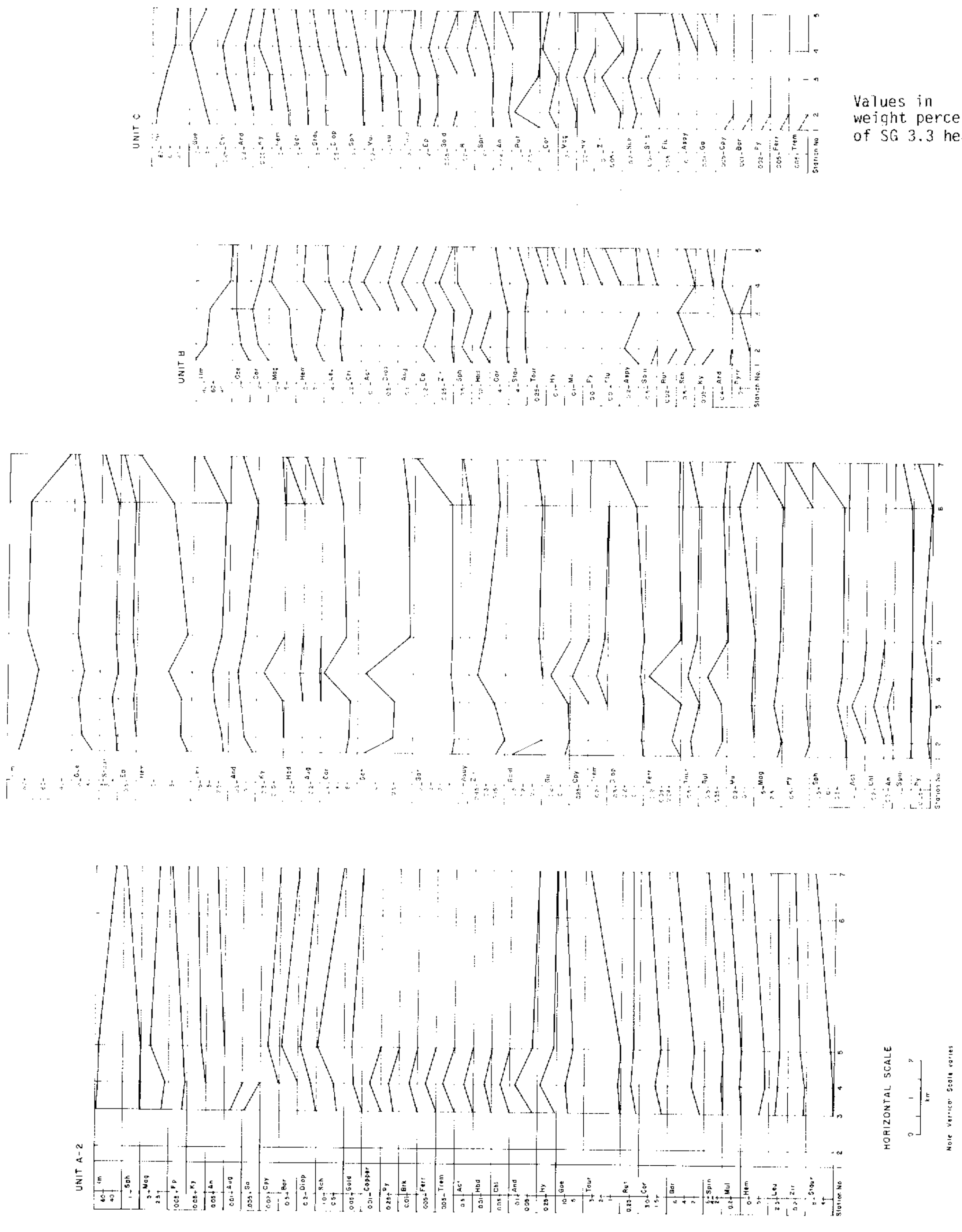
Table 6. Mineral Variation of Unit A-2 along the creek.

Station 3	Station 4	Station 5	Station 7
Vein	Vein	Vein	Vein
ga	gold, copper *(py, rut, tour, brk, sch)	gold, cpy bor (sch)	(an, rut, tour)
Skarn	Skarn	Skarn	Skarn
ep	diop, sch, ferr, trem, gar, spin (tour)	diop, sch, ep, bor, cpy	gar, spin, ep (sph, tour)
Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.
aug,zir	(hbd, rut)	zir	zir (rut, sph)
Diorite	Diorite	Diorite	Diorite
mag (zir)	hy, hbd, act, (py)	mag (zir)	sph (zir)
Schist	Schist	Schist	Schist
ilm, hem, leu	staur, and, chl	ky, staur	ky, staur, hem, leu
Met. Au.	Met. Au.	Met. Au.	Met. Au.
	and, mul, cor		cor, mul

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets denote the presence of that mineral in several rock types.

VARIATION OF MINERALOGY ALONG THE CREEK



Values in weight percent of SG 3.3 heavies

Figure 7

Variation of mineralogy along the creek

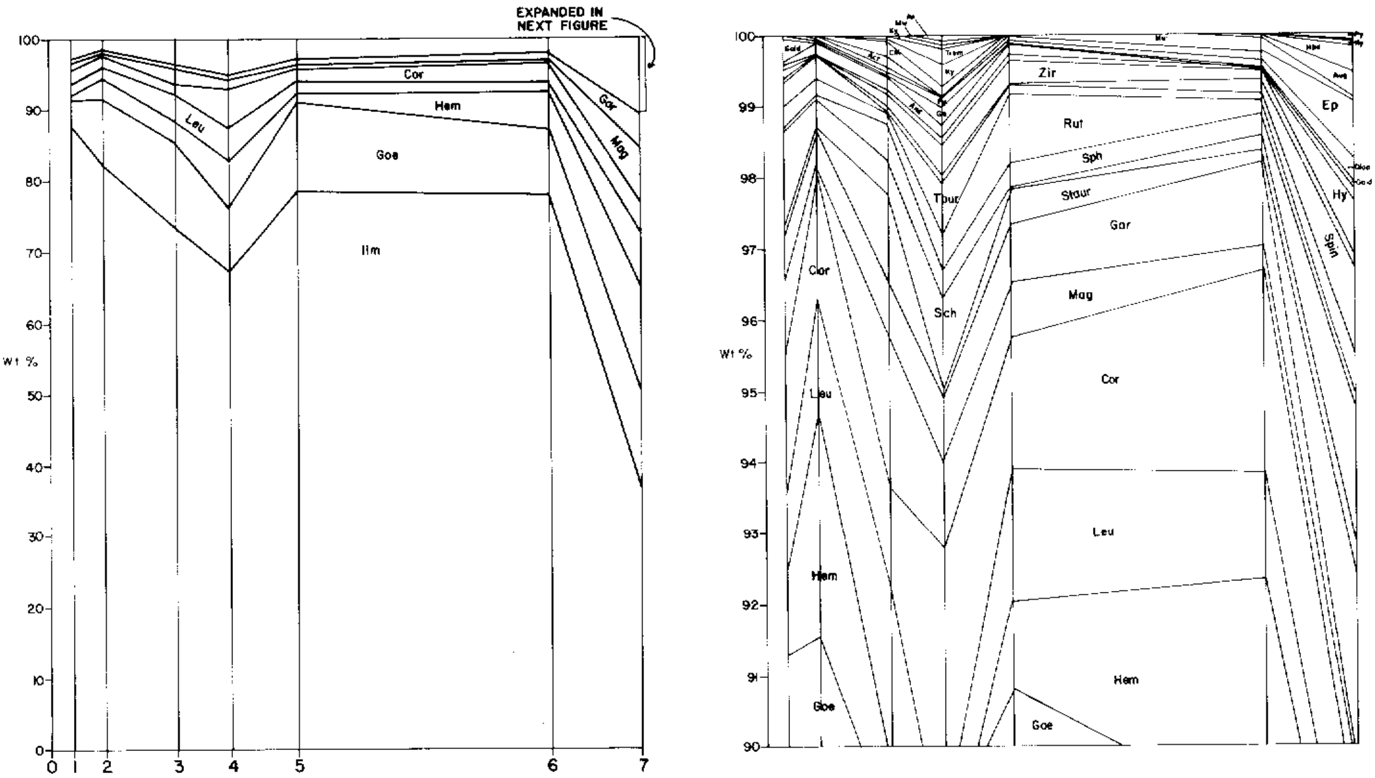


Figure 8 Variation of mineralogy in Unit A-1 along the creek; values in cumulative weight percent.

skarn and high temperature vein minerals decrease in abundance while schist and contact aureole minerals increase along with a few skarn and vein minerals, such as garnet, spinel, and anatase.

In this unit, gold is closely associated with chalcopyrite, bornite, scheelite and diopside, which are skarn or high temperature vein minerals.

Unit A-1

In Unit A-1 there are several important variations in mineralogy along the creek (see Figures 7 and 8). From station 1 to 2 there is a prominent decrease of most skarn and vein minerals including scheelite, gold, and galena (see Table 7). Most of these minerals are closely associated with the quartz monzonite intrusion which outcrops at the head of Highet Creek. The rapid decrease from station 1 to 2 is probably due to the rapid mixing and dilution of these minerals with the more abundant schist minerals from Rudolph Gulch. This indicates that there is little mineralization associated with the plug at the head of Rudolph Creek, or that it has not yet been exposed by erosion.

At station 3, there is a substantial increase in the amount of schist, diorite, and contact aureole minerals as opposed to lower temperature skarn and vein minerals. This indicates continuing dilution by the country rocks, and also indicates that there is little or no exposed mineralization associated with the plug at the head of McRae Creek.

Table 7. Mineral variation of Unit A-1 along the creek.

Station # 1	2	3	4	5	6	7
Vein	Vein	Vein	Vein	Vein	Vein	Vein
gold, ga *(sch, rut, tour	(tour)	ga, (rut, an)	cpy, ga (rut, sch tour)	gold (py)	(rut)	gold, asp (py, sch tour)
Skarn	Skarn	Skarn	Skarn	Skarn	Skarn	Skarn
spin, sch, gar (tour, sph)	diop, ferr (tour)	spin, gar, ep	sch, gar cpy, tre dio, fer spin (tour)	ep	diop, ferr, spin (sph)	diop, ferr, spin, sch, gar, ep (tour)
Met. Au.	Met. Au.	Met. Au.	Met. Au.	Met. Au.	Met. Au.	Met. Au.
cor, and	and	rut, and	cor		rut	cor, and
Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.	Qz. Mon.
(sph, rut)			aug, zir (hbd)			aug, zir (hbd)
Schist	Schist	Schist	Schist	Schist	Schist	Schist
ilm, and	and, staur, hem, leu	chl, and stau, ky hem, leu	ard, ky	ilm, staur	hem	staur, ard, ky, hem, leu
Diorite	Diorite	Diorite	Diorite	Diorite	Diorite	Diorite
mag, hy, sph		mag, hy, act, sph	hbd, mag hy, sph			mag, hy, hbd, sph (py)

Met. Au. = metamorphic aureole
Qz. Mon. = quartz monzonite

* Brackets denote the presence of that mineral in several rock types.

Unit A-1 and also Unit C have increases similar to Unit A-2 in the vein and skarn minerals at stations 4, 5 and 7 (see Table 5). It is apparent that there is exposed mineralization associated with those quartz monzonite plutons which feed the tributaries entering Highet Creek above stations 4, 5, and 7.

There are 4 major areas where exposed mineralization is associated with a quartz monzonite intrusion which results in anomalous quantities of economic minerals in the gravels. These are: 1) at the head of Highet Creek; 2) at the head of the tributary on the left limit entering above station 4; 3) at the head of Dredge Creek; and 4) the pluton just southwest of station 7.

TRACE ELEMENTS IN THE HEAVY CONCENTRATES (See Table 8)

Gold is high in the Unit A stream gravels, the highest assay, at station 5, being 112 ppm Au. Anomalously high gold occurs at station 1 in Unit A gravels (approximately 20 ppm) and also in the B and C units. Station 7 also carried anomalous gold (approximately 30 ppm) and so did station 7 (approximately 20 ppm).

All of the samples have high tungsten values, and tungsten distribution is similar to that of the gold. Tungsten is highest in the A unit with values exceeding 900 ppm at station 5 and about 500 ppm at station 1.

Semiquantitative spectrographic analyses for trace elements show several interesting anomalies. At station 5, there is an increase in the amount of copper, silver and tin that is coincident with anomalous high gold and tungsten values and several heavy mineral anomalies. Accordingly, polymetallic mineralization is probably associated with the stock at the head of Dredge Creek.

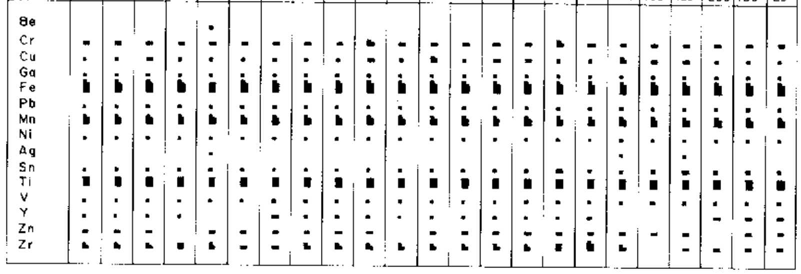
In addition, an unexplained copper anomaly occurs at station 4.

Table 8

Elements in the heavy concentrates.

Elements in the Heavy Concentrates from the gravels on Highet Creek, Y. T.

	1				2			3				4				5					6	7	
	1A	1B	1C-1	1C-2	2A	2B	2C	3A-1	3A-2	3B	3C	4A-1	4A-2	4B	4C	5Z	5A-1	5A-2	5B	5C	6A	7A-1	7A-2
Au (ppm)	20.3	15	31	4.7	11	6	2	3.9	4.6	0.06	1.4	5.6	4.8	25	2.6	0.16	54	112.7	5.5	6.9	20	30.5	11
W (ppm)	510	200	810	497	420	140	140	240	167	48	130	366	271	165	120	280	960	910	180	160	290	180	29



NB—Sb, As, Bi, Cd, Ce, Nb, Co, Ge, Li, Hg, Mo, Ta, Th, W, U, not detected

• -0.01% or less ▬ -0.01-0.1% ▗ -0.05-0.5% ■ -0.1-1% ▙ 0.5-5%

█ - 1-10% ▌ -5-15%

Analyses by X-ray Assay Laboratories, Toronto (Gold and Tungsten by neutron activation; trace elements by semiquantitative spectrography)

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George Armbrust of the University of Ottawa advised the writer on preparation of the B.Sc. thesis from which this report is summarized.

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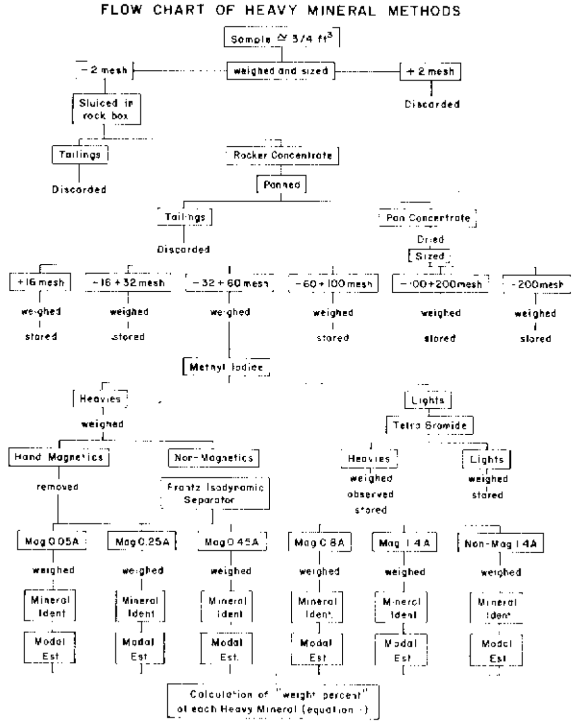
Appendix 1

Flow Chart of Heavy Mineral Methods



PETROGRAPHIC AND GEOCHEMICAL EVIDENCE FOR A HYDROTHERMAL ORIGIN OF THE RUSTY SPRINGS Pb - Zn - Ag PROSPECT

Jill Kirker
University of Calgary

INTRODUCTION

The Rusty Springs prospect is a carbonate-hosted Pb-Zn-Ag deposit located in the northern Ogilvie Mountains at 66°31'N latitude and 140°20'W longitude. It is hosted in medium to coarsely crystalline grey dolostone and dolostone breccia of the Devonian Ogilvie Formation. For a complete discussion of the geology of the area the reader is referred to the summary by Tempelman-Kluit (1981).

The Rusty Springs prospect has the basic characteristics of a Mississippi Valley-type deposit (Ohle, 1959). It is hosted in dolostone, which is locally brecciated, the ore occurs at shallow depths, and there are no associated igneous rocks. Also, hydrocarbon, which is a common feature in these deposits, is present at Rusty Springs in the form of pyrobitumen. However, several features are at variance with the Mississippi Valley-type classification. The abundant, exceptionally coarse, crystalline quartz and high silver values (up to 16,000 gm/tonne) are evidence for a hydrothermal origin.

Along these lines, Bankowski (1980) decided, on the basis of general deposit characteristics, that Rusty Springs is most similar to the deposits of the Central Irish Plain (Silvermines and Tynagh), and proposed an exhalative origin.

The purpose of this study was to determine the origin of the deposit through a clear understanding of the sedimentary, diagenetic, and mineralizing processes. The diagenetic history of the Ogilvie Formation and the pre-ore controls on mineralization were determined by detailed petrographic study. Preliminary examination of fluid inclusions in ore and gangue minerals yielded data on the composition, temperature and salinity of the ore fluid. The lead and sulphur isotopic composition of the ore also helped determine the origin of the deposit and the possible source of the mineralizing fluid.

SEDIMENTATION AND DIAGENESIS

Unlike many mineralized carbonate rocks, the Ogilvie Formation is not reefal, but is a shallow water or shelf deposit. The high porosity is secondary in origin and is either leached or solution porosity or vuggy porosity typical of sucrosic dolostone.

Spatial relationships between ore minerals and diagenetic minerals and features were used to determine controls on ore localization. The dolostone consists mainly of fine neomorphic mosaic dolomite, with coarser dolomite cement lining voids and fractures. Locally, the voids also contain thin 'films' of pyrobitumen. Late quartz and calcite cements, occurring as euhedra up to two centimeters in length, are commonly observed as the final filling in the remaining pore space. Complete replacement of dolostone by silica is found near the top of the Ogilvie Formation, and elsewhere chert occurs in small isolated patches or in fractures. The ore fluids probably contained abundant silica because mineralization is always accompanied by quartz gangue and is commonly hosted by silicified dolostone.

Cross-cutting textures observed in thin section allowed determination of the diagenetic history. Early diagenetic processes consist of mechanical compaction and cementation. Intermediate processes include pressure solution, calcite spar cementation, tectonic brecciation, pervasive, non-selective burial dolomitization, and simultaneous growth of dolomite cements and entrapment of hydrocarbon. A later stage of brecciation resulted in porous dolostone breccia which commonly contains ore. This brecciation occurred during late diagenesis and very close in time to the mineralization as indicated by strained and brecciated galena-tetrahedrite ore. Post-burial diagenesis consisted of local calcitization of the dolostone.

The absolute age of the mineralization can be estimated if one can determine the age of mineralization-related brecciation. A review of the paleogeography and tectonics of the northern Yukon shows that the only major post-Devonian tectonic episodes in the area were the Pennsylvanian-Early Permian uplift of the Aklavik Arch (Lenz, 1972) and the Late Cretaceous-Early Tertiary Eurekan Orogeny (Miall, 1973). Possibly, the earlier brecciation resulted from the former tectonism and the later from the orogeny. This interpretation would provide the mineralization with a Late Cretaceous-Early Tertiary age, which would agree with the age attributed to other Ag-rich deposits in the Yukon (Godwin et al, 1981; Tempelman-Kluit, 1981).

Petrographic examination suggests then that sedimentation had little effect on ore localization and that the major "ground preparation" processes were late burial dolomitization and tectonic brecciation. Accordingly, a mineralization age of Late Cretaceous-Early Tertiary is suspected.

FLUID INCLUSIONS

Fluid inclusions in quartz, calcite, and sphalerite were examined. They are primarily saline brines and at room temperature contain a liquid and a vapour phase. Inclusions in the coarse quartz euhedra associated with the ore are generally quite large (.05 mm) and are therefore useful for microthermometry. Commonly, these inclusions contain a third, CO_2 vapour, phase and also, at temperatures below +11°C, methane (CH_4) occurs as a separate phase. The presence of numerous daughter minerals indicates that the salinity of the trapped fluid is exceptionally high (greater than 26 equivalent weight percent NaCl). Some large inclusions contain up to six daughter crystals, most of which are halite.

Temperatures of homogenization range from 226.6°C to 150.5°C with a mean of 185.7°C. Large inclusions which contain CO_2 and/or CH_4 and those which have high homogenization temperatures often decrepitate below the temperature of homogenization due to the high internal pressure. Thus, it is suspected that the mineralizing fluid is probably hotter than the homogenization temperatures suggest.

In comparison, fluid inclusions from Mississippi Valley-type deposits contain fluids with salinities around 15 equivalent weight percent NaCl and never contain daughter minerals. The temperatures of homogenization are lower, with values ranging from 150°C to 80°C. The only deposit types which commonly have daughter minerals in the inclusions are hydrothermal subvolcanic tin-silver deposits and porphyry copper deposits (Spooner, 1980), both of which are very high temperature deposits (500°C). The lower temperatures determined for the Rusty Springs ore fluids may be explained by the decrepitation problem mentioned previously and/or may be due to dilution and cooling by meteoric waters near the surface. Accordingly, the fluid inclusion results reveal that the Rusty Springs prospect was formed by extremely saline, CO_2 and CH_4 -bearing fluids with temperatures probably in excess of 185°C.

LEAD ISOTOPES

Six samples of galena ore were analyzed for lead isotope composition by G.E. Cumming of the University of Alberta.

The linear array formed by the data (line ℓ) in Figure 1 and the high Pb^{206}/Pb^{204} values indicate that the ore lead is anomalous or radiogenic. Anomalous leads are those which are enriched in the radiogenic lead (Pb^{206}, Pb^{207}, Pb^{208}) relative to ordinary lead (Pb^{204}) and are commonly interpreted as having been derived from the uranium-rich upper crust (Doe and Zartman, 1980).

The Rusty Springs ore has a wide range of isotopic ratios, which may suggest that the source rocks had different U/Pb and Th/Pb ratios. The data were compared to those of Godwin et al (1981) for deposits of the northern Canadian Cordillera. On the basis of minor element compositions in sphalerite and lead isotope data they developed a metallogenic model which included the following three deposit types: "old" and "young" carbonate-hosted lead-zinc deposits, and silver vein-type deposits (Figure 1). Rusty Springs data plot nearest the isochron representing the silver vein-type deposits.

SULPHUR ISOTOPES

Twenty-six samples of sulphide ore were analyzed for sulphur isotopic composition. The sulphur $\delta^{34}S$ values range from -8.81‰ to +2.15‰ with a mean of -3.69‰ and a general comparison of the ore sulphur from various deposit types and Rusty Springs (Figure 2) shows that the Rusty Springs sulphur is most similar to the ore of vein-type and porphyry copper deposits.

Temperatures determined using sulphur isotope geothermometry are extremely variable ($\Delta_{sph-gal}$ = 55°C, $\Delta_{pyr-gal}$ = 317°C) indicating isotopic disequilibrium during ore deposition. Such a condition is most common in the near surface environment where boiling, mixing, and redox reactions occur. Ore deposition in the near surface due to mixing of cooler meteoric waters could also explain the lower homogenization temperatures measured.

CONCLUSION

Mineralization at the Rusty Springs Pb - Zn - Ag prospect was an epigenetic event which followed extensive late dolomitization and brecciation of the ore host, the Devonian Ogilvie Formation. The mineralizing fluids contained abundant carbon dioxide (CO_2) and methane (CH_4) as well as silica and silver which is indicative of a hydrothermal origin. The moderate temperatures (227°C to 150°C), and the extremely saline nature of the ore fluid suggest a magmatic contribution to the ore fluid. Further, the sulphur isotope geothermometry and the slightly low homogenization temperatures compared to other hydrothermal deposits suggests that there may have been mixing or dilution near the surface resulting in cooling and precipitation of ore minerals. Comparison of the lead and sulphur isotopic data to that of other deposit types illustrates that

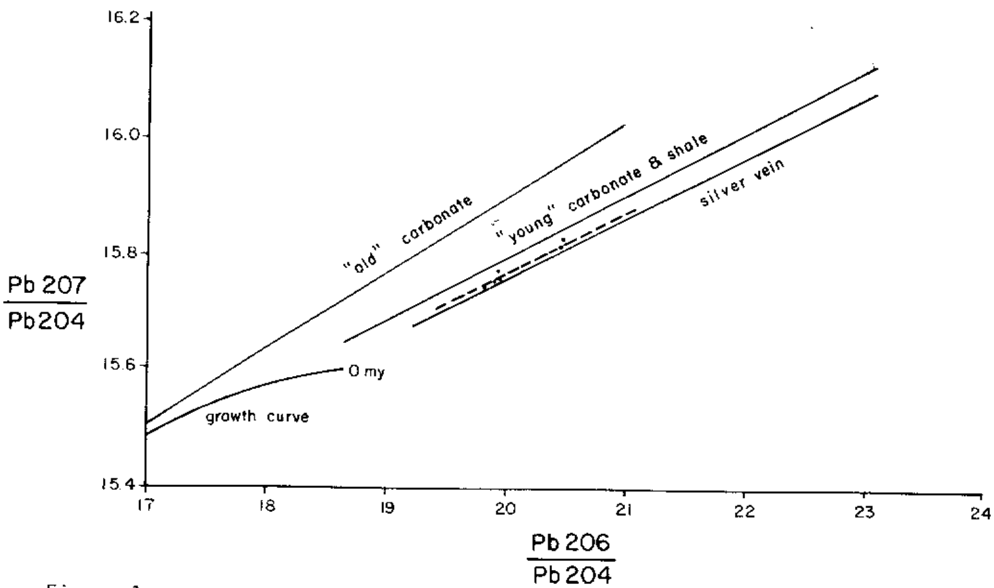


Figure 1

Pb^{206}/Pb^{204} vs Pb^{207}/Pb^{204} plot showing "old" carbonate, "young" carbonate and shale-hosted deposit, and Ag vein-type isochrons of Godwin et al, 1980 and Rusty Springs data. Dashed line illustrates the linear plot of the data.

Rusty Springs most closely resembles a hydrothermal Ag vein-type deposit.

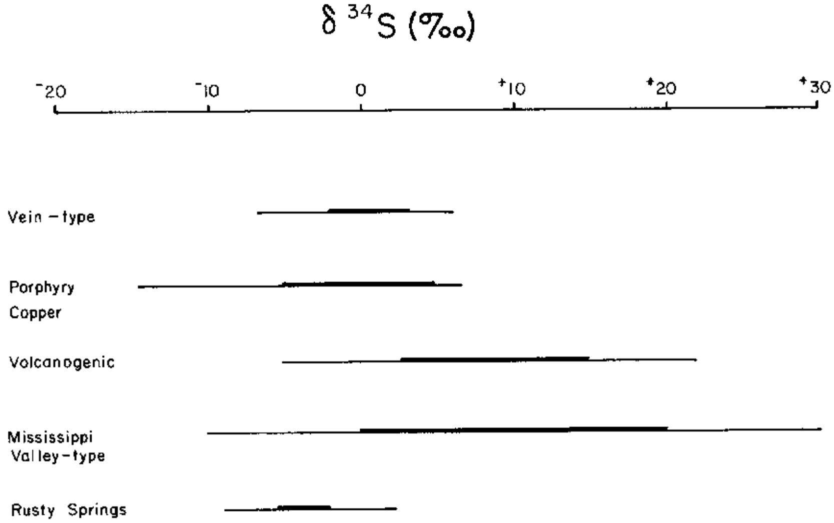


Figure 2

Generalized comparison of Rusty Springs sulphur isotopes with data from other deposit types. Data compiled from Sangster, 1972; Rye and Ohmoto, 1974; and Ohmoto and Rye, 1979.

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PRELIMINARY REPORT ON EARLY TERTIARY CLASTICS, WEST-CENTRAL YUKON

Grant W. Lowey
Department of Geology
University of Calgary

ABSTRACT

Examination of Early Tertiary clastic rocks in the Indian and Sixty Mile River areas has revealed that: 1) sediments are arranged in fining-upward sequences and are dominated by sandstone and to a lesser extent conglomerate; 2) the clastic sequence in the Indian River area is thicker than previously thought; and 3) conglomerate beds consist mainly of white vein quartz, Nasina Quartzite, Klondike Schist and chert pebbles. The metamorphic clasts were probably locally derived and the chert pebbles were eroded from the Ogilvie Mountains. These clastic rocks are interpreted as being deposited in separate, but coeval, continental basins that were mainly fed by southward flowing braided-rivers.

INTRODUCTION

Major accumulations of Early Tertiary clastic rocks are located in west-central Yukon (Figure 1). Previous work (Bostock, 1936, 1942; Cairnes, 1915; Cockfield, 1921; McConnell, 1905; Tempelman-Kluit, 1974) has shown that they consist of interbedded sandstone and conglomerate beds, locally capped and intercalated with volcanic rocks, that lie unconformably over Paleozoic and Mesozoic igneous and metamorphic rocks. The strata contain coal and paleoplacer gold, and are potential hosts for basal-type uranium mineralization.

The purpose of this study is to determine the sedimentary history and tectonic evolution of the clastic rocks. The sedimentological results may be useful as a predictive tool and as a guide to exploration of these deposits. The present paper is concerned with the results of the first season of field work.

Field Work

Field work concentrated on exposures along the Indian and Sixty Mile Rivers. Approximately two months were spent in the Indian River area and one month in the Sixty Mile River area. Stratigraphic sections were measured at both localities (drill core was also examined in the Indian River area). Samples were collected to determine the composition of sandstone and conglomerate beds, for K-Ar and palynological dating, and to evaluate the economic potential of the deposits.

RESULTS

Indian River

Exposure is very poor in the Indian River area and only short (less than 2 m) sections were measured. However over 1,240 m of drill core were logged. Based on the examination of the drill core, four units are recognized: red conglomerate, white conglomerate, black conglomerate and volcanic rocks.

Red Conglomerate

This unit is found only in drill hole 5 (Figure 2) and is stratigraphically the lowest clastic unit. It consists of interbedded conglomerate (10%), sandstone (80%) and siltstone (10%) beds. Clast composition of the conglomerate beds is very distinct (Figure 3, 4), consisting of white vein quartz (45%), light grey quartzite (5%), volcanic rock (10%) and grey, green, red and black chert (40%) pebbles (with pyritized radiolarians found in one pebble).

White Conglomerate

This unit is found in all drill holes (Figure 2) and is the most voluminous and stratigraphically highest clastic unit. It consists of interbedded conglomerate (20%), sandstone (60%), siltstone (15%) and claystone (5%) beds, arranged in fining-upwards sequences (conglomerate-sandstone-siltstone, or sandstone-siltstone).

Conglomerate beds are light grey and 0.3 m to 3 m thick. They are clast supported with a fine- to medium-grained sand matrix and are usually massive. Clast composition (Figure 3, 5) is extremely uniform, consisting of white vein quartz (70%-95%), light grey quartzite (3%-15%) and dark grey schist (2%-15%) pebbles.

Black Conglomerate

This unit is found in drill holes 1, 3 and 7 (Figure 2), and is stratigraphically within the white conglomerate unit. It consists of interbedded conglomerate (20%), sandstone (70%) and siltstone (10%) beds, that are also arranged in fining-upward sequences. The black conglomerate unit is identical in clast composition (Figure 3) to the white conglomerate unit, and differs only in having a matrix consisting of fine -grained graphite (Figure 7).

Volcanic Rocks

Volcanic rocks are found in drill holes 2, 3, 7 and 8, and consist of a lower and upper flow. The lower volcanic flow is andesitic, consisting of plagioclase (10%), hornblende (5%) and biotite (5%) phenocrysts in a light grey groundmass (80%). It is fresh in appearance except at the volcanic-clastic contact where it is overlain by sandstone or siltstone beds. The upper volcanic flow is also andesitic, consisting of hornblende (10%), plagioclase (15%) and biotite (5%) phenocrysts in a dark grey-green groundmass (70%). It is altered for 20 m above the clastic-volcanic contact (drill hole 2) and is underlain by sandstone beds. The upper flow was mapped as the Carmacks Group volcanics by Bostock (1942).

Coal and Gold

A 1.5 m coal seam is exposed in a tributary of Ruby Creek (6 km southwest of drill hole 1), and a 1.5 m coal seam was found at the 45 m depth in drill hole 1. Both seams consist of lignite to sub-bituminous coal.

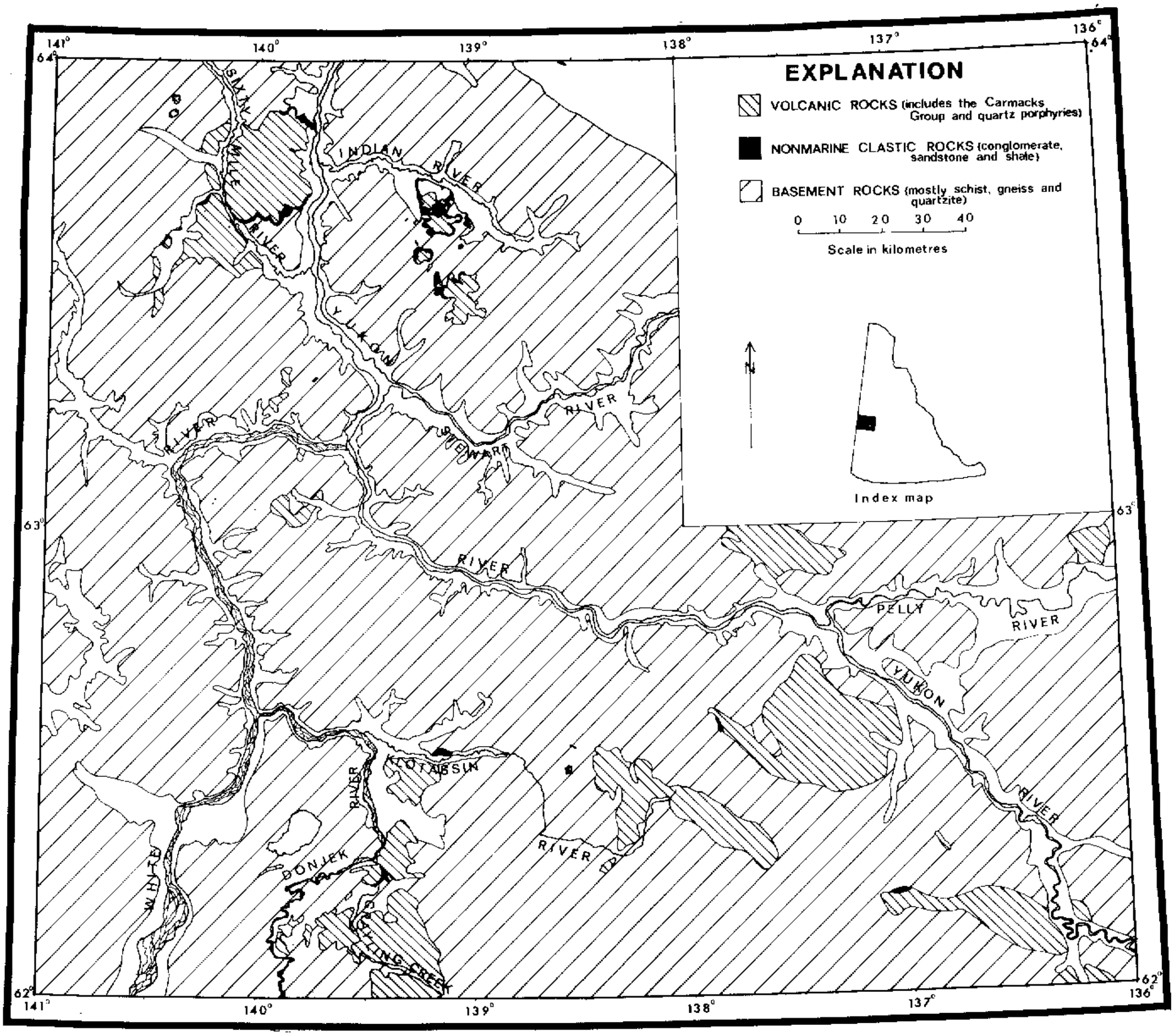

Figure 1

Index map and general geology, west-central Yukon (Modified from Bostock, 1936; Tempelman-Kluit, 1974)

Gold values of 0.17 g Au/t are present in conglomerates from surface and drill core samples.

Sixty Mile River

Approximately 150 m of strata were measured in three sections along the Sixty Mile River (Figures 2, 8). Strata dip approximately 15° north, and consist of interbedded conglomerate (30%), sandstone (40%), siltstone (25%), limestone (2%) and tuff (3%) beds (Figure 9). These are arranged in fining-upward sequences (conglomerate - sandstone - siltstone, or sandstone - siltstone).

Conglomerate beds are light grey and 0.5 m to 2 m thick. They are mostly clast supported (one matrix supported bed was found and is probably a debris flow), with a fine- to coarse-grained sand matrix and are massive. Clast composition varies widely (Figure 8). The stratigraphically lowest conglomerate bed rests nonconformably on monzonite (Figure 10).

Sandstone beds are light grey and 0.3 m to 2 m thick. Grain size ranges from fine- to coarse-grained sand with a silty matrix that is frequently pebbly. They are massive or horizontally laminated.

Siltstone beds are dark grey to black and 0.1 m to 2 m thick. They are horizontally laminated and plant fragments are present.

Limestone beds are black and 0.1 m thick. They are very fine-grained and occur in a thick siltstone sequence near the middle of section 2 (Figure 11).

Tuff beds are light grey and 0.5 m thick. They are horizontally laminated crystal vitric tuffs and occur near the top of sections 1 and 2 (Figure 2, 12).

Gold

Only one gold occurrence is reported in the conglomerate beds (Tempelman-Kluit, 1971), and assayed samples contain 0.17 g Au/t.

DISCUSSION

Depositional Environments

Sediments in the Indian and Sixty Mile River areas are interpreted as being deposited in a braided -river environment of the Donjek type (Miall, 1977), and not by alluvial fans as suggested by Hughes and Long (1980). The Donjek type braided-river (named after the Donjek River, Yukon) is characterized by widely varying gravel content and cyclic sedimentation, in which the fining-upward cycles (due to channel aggradation and switching) may range from less than 1 m to over 20 m thick (Miall, 1977).

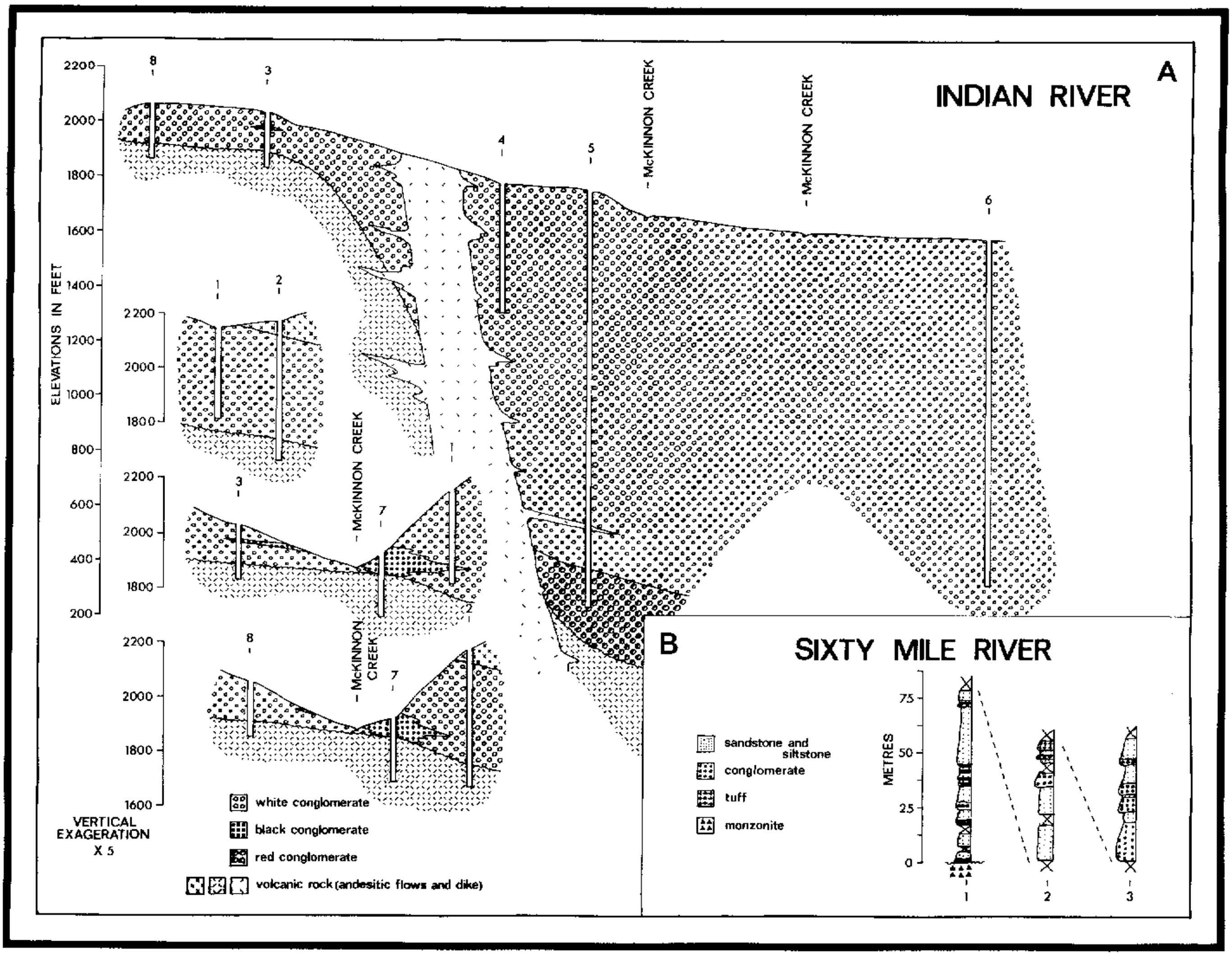

Figure 2

A. Cross sections based on drill hole data, Indian River area.
B. Stratigraphic section, Sixty Mile River area (this is a composite section based on sections 1, 2 and 3).

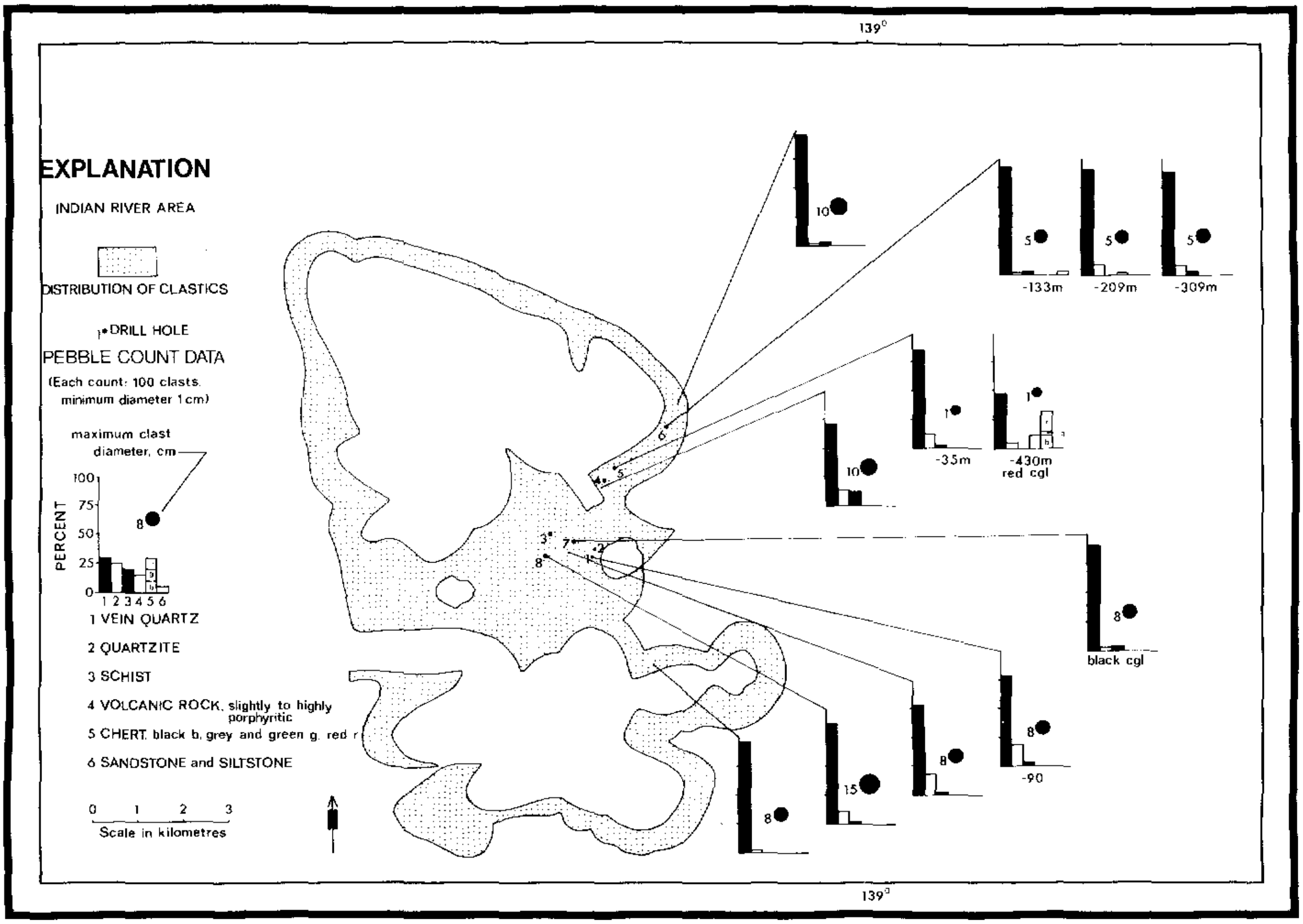

Figure 3

Composition of conglomerate, Indian River area; all compositions represent the white conglomerate unit unless otherwise indicated (modified from Bostock, 1942).

Conglomerate and sandstone beds are interpreted as the products of deposition in fluvial (braided -river) channels. Thick conglomerate beds (greater than 0.2 m) represent the accumulation of superimposed longitudinal bars and thin conglomerate beds (less than 0.2 m) formed as channel lag deposits. Planar cross-bedded sandstones formed by the migration of simple foreset bars and sand waves, and horizontally bedded and massive sandstones represent low energy channel deposits.

Sandstone, siltstone and claystone beds are interpreted as floodplain and lake deposits. Horizontally bedded and massive sandstones were deposited as levees and crevasse splays, and laminated sand, silt and mud were deposited during the waning stages of floods or as fill in abandoned channels.

Provenance

Metamorphic clasts in both areas were locally derived. The quartzite clasts were eroded from the Nasina Quartzite (unit PPqc, Tempelman-Kluit, 1974; unit E, Bostock, 1942), and the schist pebbles were eroded from the Klondike Schist (unit PPsqmu, Tempelman-Kluit, 1974; unit B, Bostock, 1942). Volcanic clasts were also locally derived and pebbles found in the red conglomerate unit (drill hole 5, Figure 2) may have been eroded from the lower volcanic flow. Chert pebbles (particularly grey and black) were derived from the Ogilvie Mountains north of the Indian and Sixty Mile Rivers (mainly from unit 9, Road River Formation, but also from units 13 and 14, Green, 1972).

Note that in the Indian River area the con-

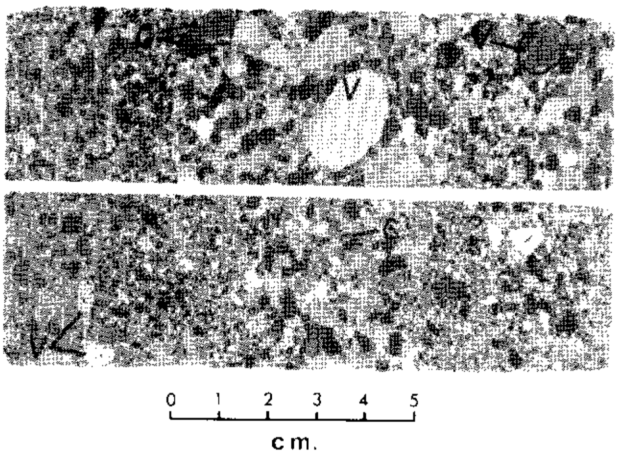

Figure 4

Conglomerate from the red conglomerate unit (Indian River area); V=volcanic, C=chert.

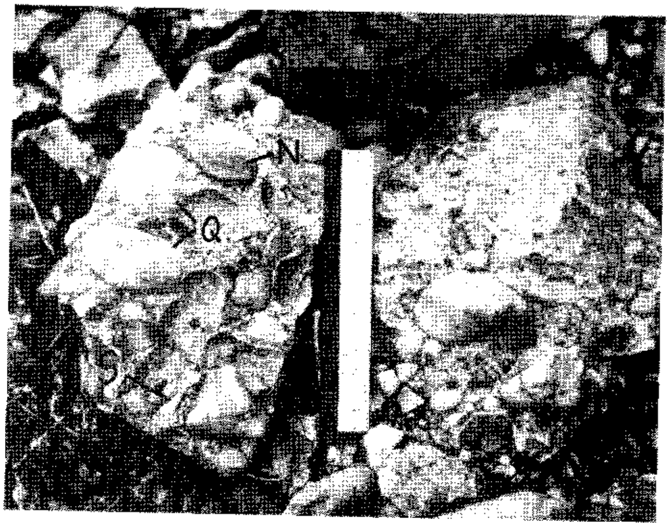

Figure 5

Conglomerate from the white conglomerate unit (Indian River area); N=quartzite, S=schist, Q=vein quartz.

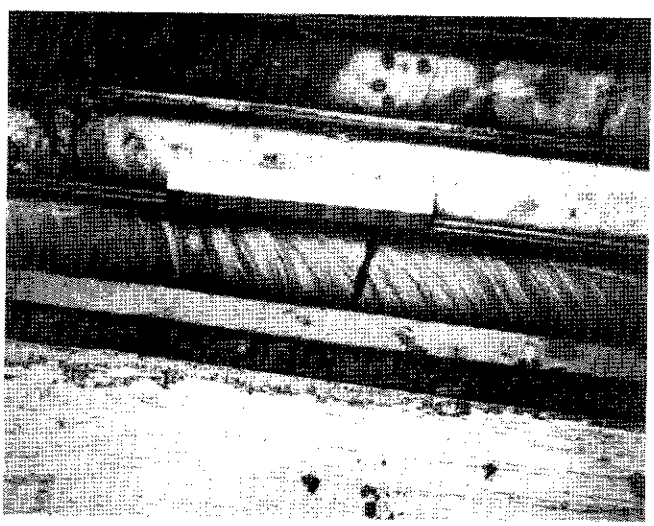

Figure 6

Planar-parallel crossbedding in sandstone from the white conglomerate unit (Indian River area).

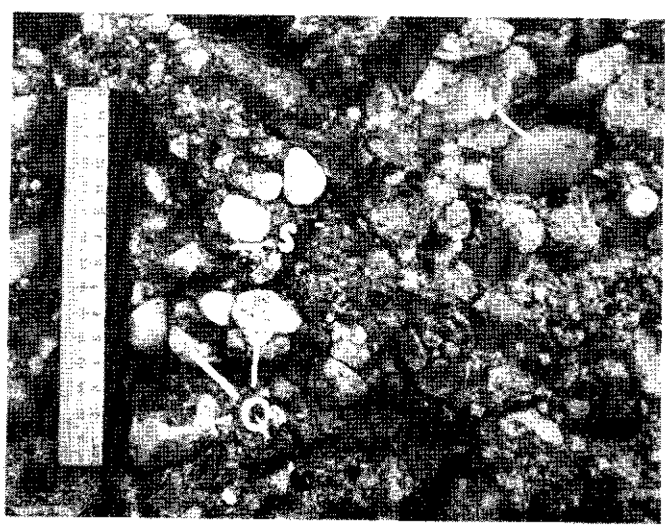

Figure 7

Conglomerate from the black conglomerate unit (Indian River area); N=quartzite, S=schist, Q=vein quartz.

glomerate composition changes stratigraphically from mainly chert to mainly metamorphic-rock pebbles, but in the Sixty Mile River area the conglomerate composition changes stratigraphically from mainly metamorphic-rock to mainly chert pebbles. This reversal in provenance suggests that the sedimentary history of the two areas was unrelated.

Basins

Early Tertiary clastic sediments within Tintina Trench in the southern and central Yukon are interpreted by Hughes and Long (1980) to be deposited in continuous or discontinuous, fault bounded continental basins. Sediments in the Indian and Sixty Mile River areas are similar in appearance and induration, and conglomerate compositions are similar (but strati-

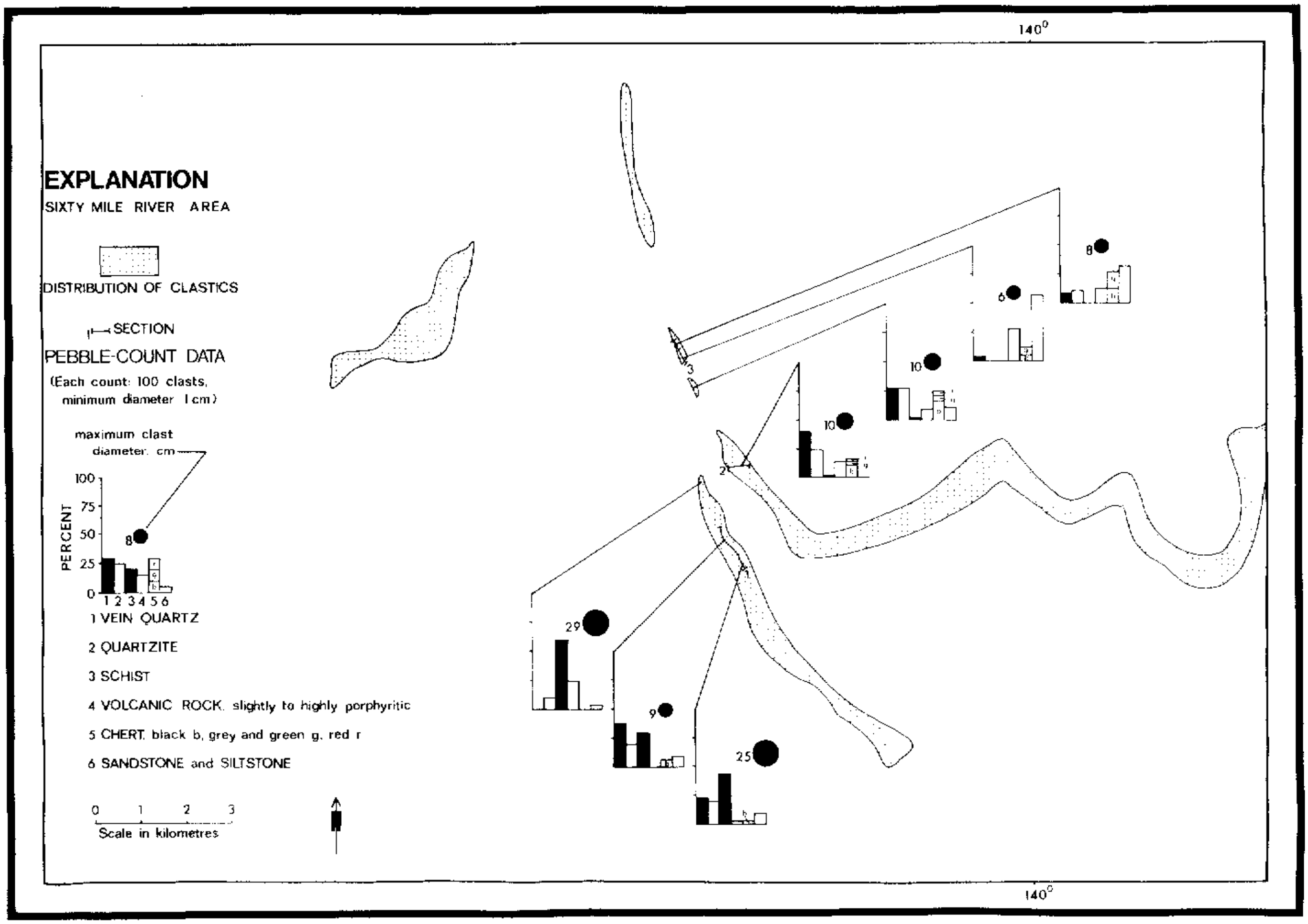

Figure 8

Composition of conglomerate, Sixty Mile River area (modified from Tempelman-Kluit, 1974).

graphically reversed). This suggests that the clastic assemblage in the two areas represent separate, but coeval, basin fill sequences. The basins were mainly fed by southward flowing braided-rivers carrying locally derived clasts of metamorphic rocks and pebbles of chert from the Ogilvie Mountains.

Directions of Study

Compositional analysis of the sandstone beds and conglomerate matrices is in progress. Palynomorphs have been recovered, but not yet identified, from fine-grained sediments. Six K-Ar samples from the lower and upper volcanic flows and the tuff beds are being prepared for analysis. Approximately one month of field work (Spring, 1982) is planned in the Sixty Mile River and Grayling Creek areas to complete the study.

ACKNOWLEDGEMENTS

I am particularly grateful to Dirk Tempelman-Kluit for suggesting this topic. Ilya Soliterman provided assistance in the field. Discussions with Dirk Tempelman-Kluit and Len Hills, both of whom visited me in the field, were useful. This study forms the basis of a Ph.D. thesis at the University of Calgary, and field work was financially supported by D.I.A.N.D. Geology Section, Whitehorse.

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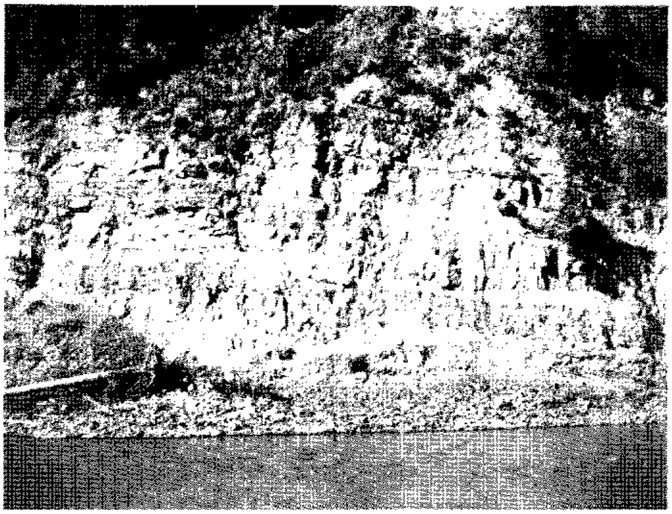

Figure 9

Interbedded conglomerate, sandstone, and siltstone beds (section 1, Sixty Mile River area).

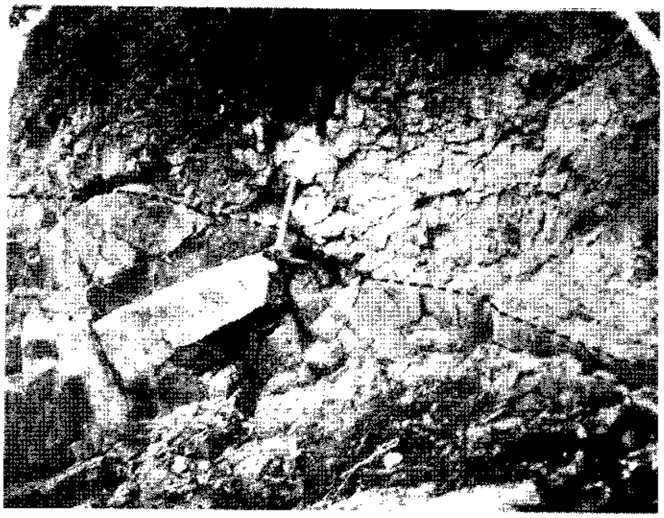

Figure 10

Nonconformity between monzonite and conglomerate (section 1, Sixty Mile River area).

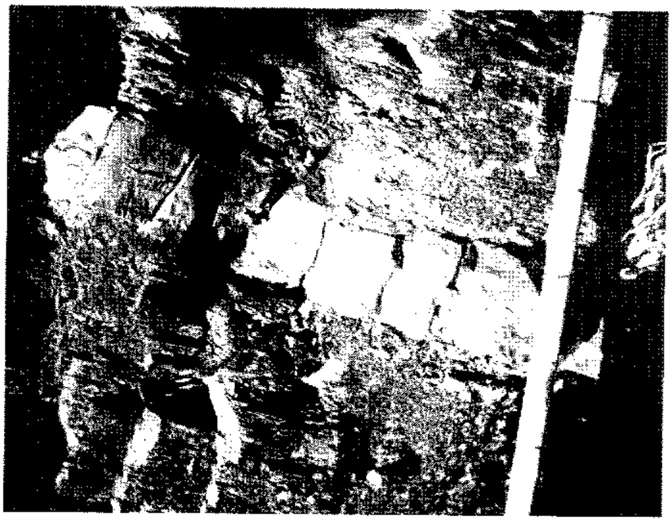

Figure 11

Limestone bed in a siltstone sequence (section 2, Sixty Mile River area).

Figure 12

Tuff Beds (section 1, Sixty Mile River area).

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THE CO-VARIATION OF LITHOLOGY AND GEOMETRY
IN TRIASSIC REEFAL LIMESTONES
AT LIME PEAK, YUKON

R. Pamela Reid
University of Miami
Fisher Island Station
Miami Beach, Florida 33139

INTRODUCTION

Lime Peak is an Upper Triassic carbonate complex approximately 40 km northeast of Whitehorse (Figure 1). It is one of many carbonate buildups in the Whitehorse Trough which occur as isolated lenses surrounded by Triassic greywacke and volcanic-clast conglomerate derived from an arc to the southwest. The carbonates at Lime Peak are particularly well-exposed and have been shown to be a series of organic reefs which shed debris into surrounding inter-reef areas (Reid, 1981).

The Triassic is a turning point in the history of reef building because it marks the first appearance of the scleractinian corals, the major reef builders of the Cenozoic. Most of our knowledge about reefs in this critical period comes from studies in Europe where Triassic reefs are well developed; previously reported Triassic reefs in North America are generally thin accumulations which did not attain much relief above the sea floor (Stanley, 1979). Therefore the thick well-developed reef complex at Lime Peak offers a special opportunity to study Triassic reef development in North America.

Field work at Lime Peak in 1980 established the existence of massive reefal limestones, as shown in Figure 2. In general, these limestones occur in 1 or 3 distinct forms:

1) thin tabular bodies about 25 m thick which may be capped with sub-aerial conglomerate (these are labelled "1" in Figure 2);
2) thick lenses up to 150 m thick, one of which has inclined flanking beds on one side (the lenses are labelled "2" in Figure 2);
3) irregular masses of various shapes which range in thickness from a few metres to 100 metres and are usually surrounded by shaley limestone (these are the unnumbered massives in Figure 2).

The two lenses on the western side of Lime Peak are dominant features of the landscape and have been named Avens and Campion for convenient reference (Figure 2).

The variability of both the geometry and the lithology of the massive limestones was observed in 1980 but was not studied in detail. Considerable effort was spent in 1981 mapping lithology in order to establish the nature and extent of organic framework in the reefal bodies and to develop an explanation for the three distinct growth forms.

RESULTS OF THE FIELD STUDY

The principal field observations used to subdivide lithology within the massive limestones were a) percentage of macrofossils and b) whether or not the fossils were bound together by dark coatings. Based on these features, bindstones, floatstones/rudstones and packstones/grainstones were recognized; (definitions are according to Embry and Klovan, 1971; "/" abbreviates "and/or"). In addition, rocks containing large-toothed bivalves (megalodonts) were mapped as a separate unit. More complete descriptions of the four field units are given below.

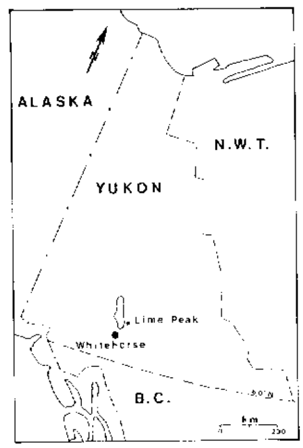

Figure 1
Index map showing the location of Lime Peak, Yukon.

Bindstone

Field definition: rock comprised of more than 50% macrofossils bound together by dark biogenous coatings.

Additional features: Centimeter-sized voids are abundant and may be lined with multilayered, isopachous cement and/or filled with internal sediment. The principal framebuilding organisms are generally less than 2 cm in size and include sponges (inozoans and sphinctozoans), tabulozoans/bryozoans, spongiomorphs and corals; there is no apparent vertical or horizontal zonation in the distribution of these organisms within the bindstone. The unbroken skeletons, the organic binding which is probably algal and the lack of matrix indicate an *in situ* framework structure that formed in a shallow agitated environment. The appearance of a typical bindstone is shown in Figure 3a.

Floatstone/Rudstone

Field definition: rock comprised of more than 10% macrofossils in a fine-grained lime matrix; the fossils are not bound by dark coatings.

Additional features: The macrofossils may form a grain-supported structure (rudstone) or may float in the lime matrix (floatstone). Cement-filled voids may be found but are not abundant. The fossils include the small framebuilders of the bindstone as well as larger sponges, occasional colonies of branching spongiomorphs and a slender branched coral (*Thecosmilia* sp.) in growth position and abundant shells. Examination of thin sections shows that many of the skeletons are broken and that the fine-grained matrix is a very poorly sorted mixture of sand-sized fossil fragments and

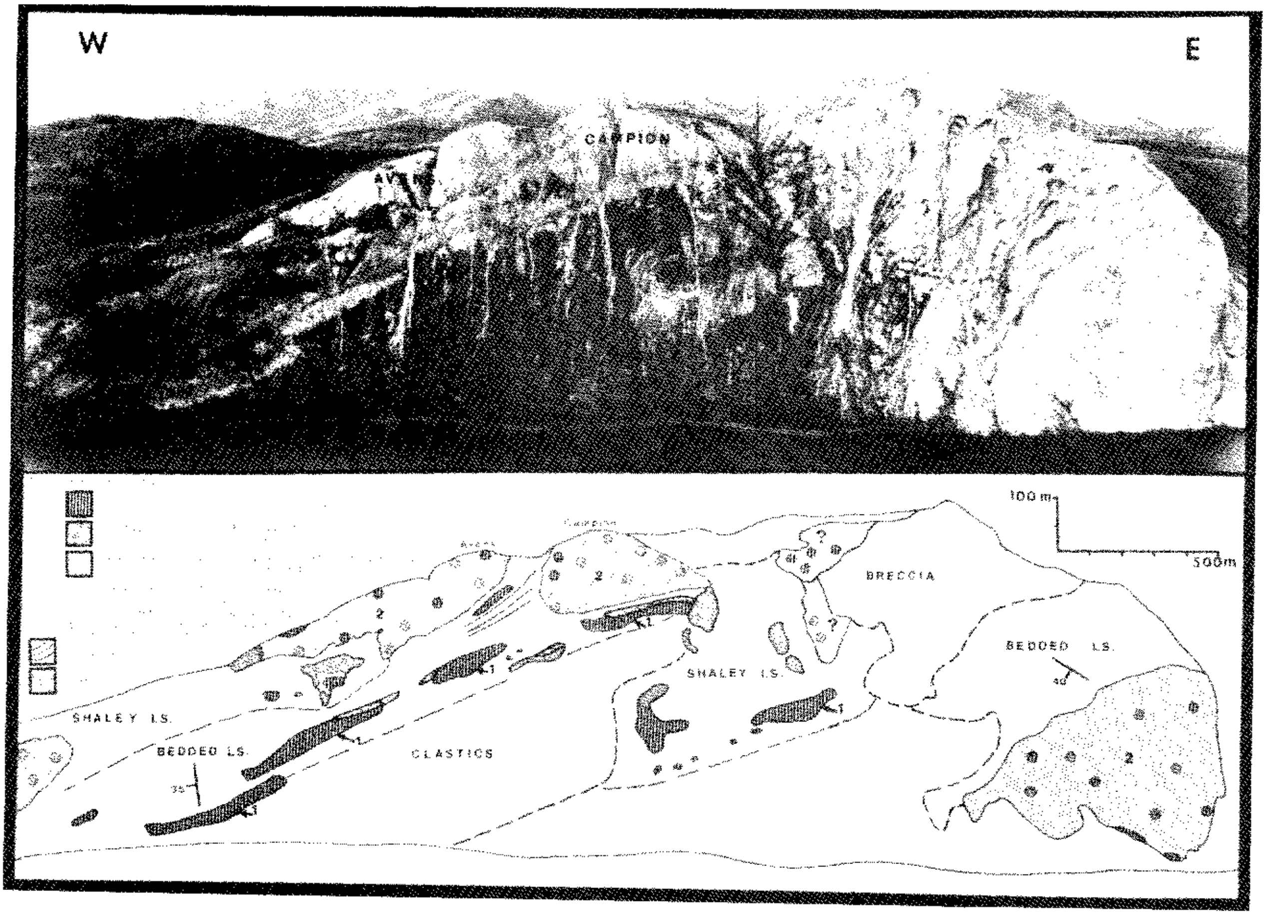

Figure 2
Generalized distribution of lithology on the south face of Lime Peak showing the variation in the massive reefal limestones. The thin tabular bodies (#1) are mainly bindstone; the thick lenses (#2) are mainly packstone/grainstone and the irregular massives (unnumbered) are mixtures of bindstone, floatstone/rudstone and packstone/grainstone.

mud. The growth position of some of the organisms and the very poor sorting of the matrix suggests an in situ accumulation and disintegration of skeletons in a low energy environment. A typical floatstone is shown in Figure 3b.

Packstone/Grainstone

Field definition: rock containing less than 10% macrofossils in fine-grained limestone.

Additional features: In general this rock has a homogenous, smooth, grey, muddy appearance in the field and weathers in smooth resistant surfaces; occasional laminated pockets and cement-filled voids may be found. Examination of thin sections shows that the rocks are poorly to well-sorted mixtures of sand-sized fossil fragments and mud. In general, the fossil fragments are grain supported; they may be surrounded by a mud matrix (packstones) or by calcite cement (grainstones). The variable sorting of the sandstones indicates moderate to low agitation in the environment of accumulation. A typical grainstone is shown in Figure 3c.

Megalodont Rock

Field definition: rock containing large-toothed bivalves (megalodonts).

Additional features: The megalodonts are up to 25 cm in diameter. They are mostly unbroken and occur in banks several metres thick and as isolated shells in fine-grained limestone. Other organisms found within this unit include Thecosmilia coral colonies, large gastropods, chaetitids and Dicerocodium pelecypods. In Triassic carbonate complexes in Europe, megalodonts are typically found in shallow-water, back-reef lagoons. The concentration of shells in one of the megalodont banks at Lime Peak is shown in Figure 3d.

The general distribution of the four lithologic units on the south face of Lime Peak is shown in Figure 2. It is apparent from this figure that each of the three forms of massive limestone has a distinct lithology:

1) the thin tabular bodies are mainly bindstone;
2) the thick lenses are mainly packstones/grainstones; however, subordinate amounts of bindstone and floatstone/rudstone are found in patches up to several metres in diameter throughout the lenses and an extensive megalodont facies has developed on the northwest side of the Avens complex; (because the

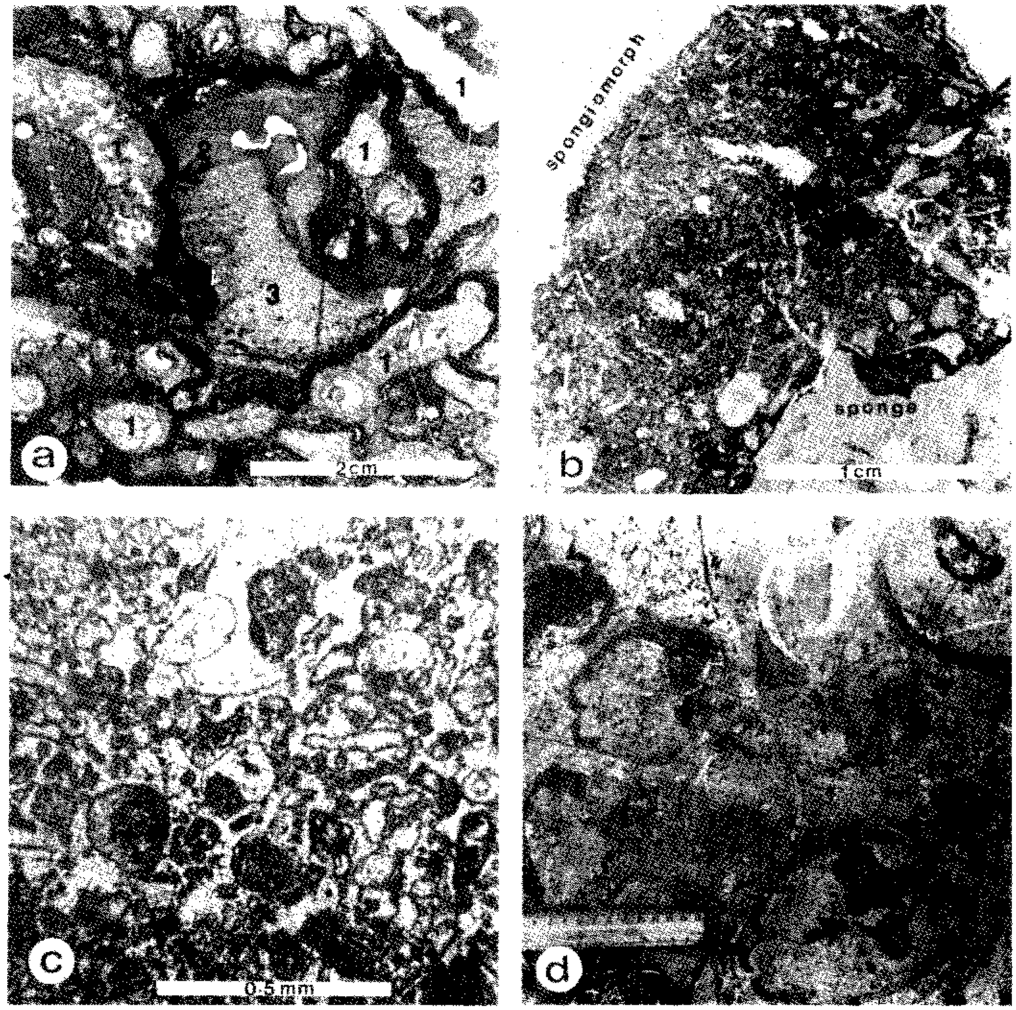

Figure 3

Examples of lithology in the massive limestones:

3a. Bindstone; framebuilding sponges (1) are bound by dark coatings (2) and voids are filled with layered internal sediment (3).

3b. Floatstone; macrofossils such as sponges and spongiomorphs float in a poorly sorted matrix of lime sand and mud.

3c. Grainstone; sand-sized fossil fragments are surrounded by calcite cement.

3d. Megalodont rock; arrow points to large tooth in one of the megalodont bivalves; scale is in centimeters.

megalodont unit is found only on the northwest side of Avens, it is not seen on Figure 2);

3) the irregular masses have varying lithology - several are mainly floatstone/rudstone, others are mainly bindstone or an alternation of bindstone and floatstone/rudstone and one is mainly packstone/grainstone.

Significance

The common occurrence of bindstone in each of the three forms of massive limestone at Lime Peak suggests that these limestones all formed in shallow water with similar parameters of water quality. Therefore, the varying proportions of lithology in the massive limestones and the forms of the accumulations probably reflect variations in the degree of agitation, and the balance between relative sea level change (eustatic or tectonic) and the rate of accumulation in the environment of deposition rather than gross differences in water depth. The thin tabular bodies which are almost entirely bindstone formed in a very agitated environment probably in the zone of strong wave action. A period of exposure followed the deposition of some of these bodies, as indicated by the presence of overlying conglomerate with sub-aerial features. The tabular shape of the bodies may be the result of a short period spent in the very agitated environment or may be caused by inhibition of vertical growth of the reef community because of the lack of relative rise of sea level.

The thick lenses of packstone/grainstone formed in a generally less energetic environment than the tabular bodies but patches of bindstone developed in local areas of increased agitation. The uniform distribution of the bindstone patches throughout the lenses suggests that there was no asymmetry of wave action and that the lenses probably developed within a platform rather than a shelf margin. A relative rise of sea level during the accumulation of the packstone/ grainstones allowed the development of thick massive buildups with considerable relief, as indicated by the slope of the beds west of the Campion complex. Differentiation of facies accompanied the formation of the Avens massive, as indicated by the development of a back-reef lagoon with megalodonts.

The development of the irregular masses is not well understood. The thick bodies of bindstone and floatstone/rudstone may have formed as reef communities grew upward during a rapid rise of relative sea level: bindstone formed when the buildup stayed within the surf zone as sea level rose; floatstone/rudstone formed when the communities developed in more protected quiet water. The significance of the association of the shaley limestones (alternating thin beds of mudstones and graded packstones) with the irregular masses is also not yet clear.

Bindstone is the only lithology at Lime Peak which represents the development of true organic framework in the massive limestones. The framework is constructed by very small builders, primarily sponges, tabulozoans/bryozoans, spongiomorphs and solitary corals which are bound together by biogenous coatings; these organisms show no obvious horizontal or vertical zonation. Although some of the smaller massives at Lime Peak are almost entirely bindstone, this framework forms only a very small proportion of the largest massives. More extensive development of organic framework may have been limited by the growth potential of the Lilliputian reef builders.

The massive limestones at Lime Peak show remarkable variety in lithology and geometry, yet there is a definite pattern to the variability of the reefal bodies. The history of reef building at Lime Peak can be related to the processes controlling sedimentation on this active subduction margin and the variety of reef forms may reflect the unstable tectonic setting.

ACKNOWLEDGEMENTS

Special thanks are due to Jennifer O'Brien who provided able assistance and excellent companionship in the field again this year as well as making approximately 400 thin sections in Miami. The guidance provided by Dirk Tempelman-Kluit and R.N. Ginsburg was greatly appreciated. Financial support for the fieldwork aspect of this study was provided by the Geology Section, D.I.A.N.D., Whitehorse.

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PETROLOGY & GEOLOGY OF HIGH LEVEL RHYOLITE INTRUSIVES OF THE SKUKUM AREA, 105 D SW, YUKON TERRITORY

by
Monica Jean Smith
Department of Geology
University of Ottawa

ABSTRACT

The Skukum area is located 58 km south-southwest of Whitehorse. It is an elliptical area of volcanic rocks, Tertiary in age, and surrounded by hypabyssal rhyolite intrusives. Field and petrographic evidence, fluorite and tourmaline stockwork, breccia pipes, roof pendants, miarolitic cavities and spherulites in the nine Skukum rhyolites suggest that they were emplaced at a high level. The intrusives vary in composition from rhyolite to dacite. The variation in texture within and between the intrusives can be explained by different rates of crystallization, temperature differences and compositional variability.

Chemical data are in accord with the expected trends in a cogenetic suite of igneous rocks. Relatively low CaO and MgO, high SiO_2 and anomalously low Sr concentrations indicate that the rhyolites were formed from a highly differentiated magma. Sr and Ba versus Al_2O_3 plots show that both K-feldspar and plagioclase were important fractionating phases. Rare earth element data further support this conclusion and also suggest that some accessory phase(s), such as monazite, allanite or fluorite help control the rare earth element behaviour. Partial melting of an already depleted source rock with residual plagioclase can also explain the patterns.

The Bennett Lake ring and associated dykes are petrographically and chemically similar to the Skukum intrusives. However, Zr and TiO_2 are present in higher concentrations in the Bennett Lake complex, indicating that they were derived by a slightly different fractionation process.

INTRODUCTION

The Skukum area is located in the Yukon 58 km south-southwest of Whitehorse (Figure 1). Previous geological work includes thorough documentation by D.D. Cairnes (1912, 1916) of the Wheaton River District in a report and geological map. Subsequently, the Skukum area was mapped as part of the Whitehorse map area by J.O. Wheeler (1961) and Morrison included it in his metallogenic study of the Whitehorse map area (Morrison, 1979). The nine rhyolite intrusives studied are identified in Figure 2. The field investigation took place during the summer of 1981. Extreme topographic relief and good exposure provided an excellent opportunity for a three dimensional examination of the Skukum rhyolites. Representative samples were collected for both petrographic and geochemical examination.

The aim of this project was threefold: 1) to test the hypothesis that the Skukum rhyolites are late stage intrusives related to one cogenetic suite of igneous rocks and may represent late associated ring fracture intrusions related to a cauldron event; 2) to determine the origin of the rhyolite intrusives; and 3) to compare the rhyolites with other rhyolites of the North American Cordillera, specifically those described by

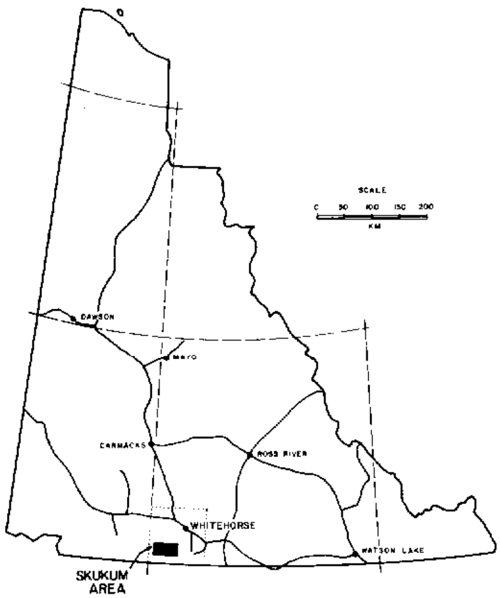


Figure 1

Location map showing Skukum study area.

Lambert (1974).

GEOLOGY

The Skukum area is an elliptical zone of Tertiary volcanic rocks surrounded by high level rhyolite intrusives. The Skukum intrusives of the Mt. Nansen Group intrude predominantly granitic rocks of the Coast Plutonic Belt. The oldest rocks in the region include a northwesterly-trending belt of Precambrian metasedimentary rocks engulfed by the granitic rocks. The northeast part of the Skukum area is mainly Mesozoic sedimentary and volcanic rocks. The Lower Tertiary intermediate to felsic volcanic rocks of the Mt. Nansen Group unconformably overlie and intrude the Precambrian metasedimentary rocks and granitic rocks west of the eastern margin of the Coast Plutonic Belt. The Mt. Nansen Group (in the Yukon) outcrops in two isolated areas in the southern half of the Whitehorse map sheet (105 D): the Skukum complex and the Bennett Lake complex (Figure 3). The Bennett Lake complex was studied by Lambert (1974) and consists mainly of rhyolite and dacite ash-flow tuffs and breccias with subordinate rhyolite, dacite and andesite lavas. The volcanic complex is partly circumscribed by a large rhyolite dyke. Lambert concluded that the "complex consists of two nested calderas, an eroded structural dome and a thick succession of pyroclastic and epiclastic rocks related to eruption, subsidence and filling of the cauldrons" (Lambert, 1974, p. 9).

Based on gross similar geologic and structural characteristics, Lambert (1974, p. 174) proposed that the Skukum region may represent "another cauldron sub-

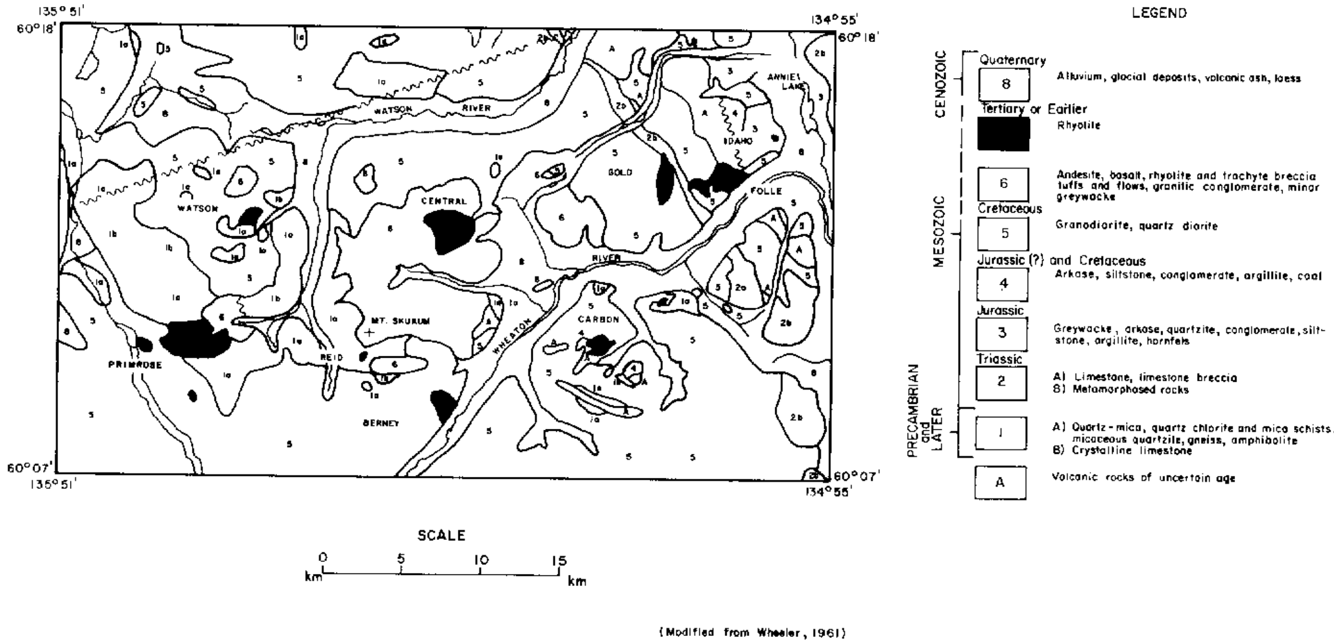


Figure 2

General geological map of the Skukum area, modified from Wheeler (1961).

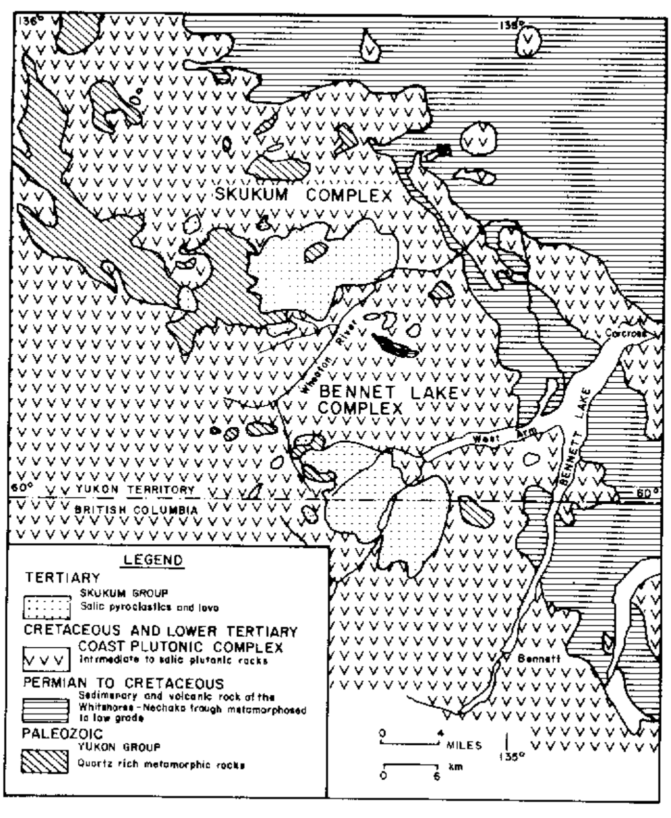


Figure 3

General geological map showing the location of the Skukum and Bennett Lake volcanic complexes, modified after Lambert (1974).

sidence complex closely related in time to the Bennett Lake complex." The Skukum rhyolites, which are the major focus of this study, may thus represent late associated ring fracture intrusives related to a cauldron event. Conversely, the Skukum area may also represent a sequence of ash-flow tuffs and lava flows equivalent to the distal facies of the Bennett Lake complex. The intrusives might then be interpreted as related or unrelated individual volcanic conduits or plugs.

SKUKUM RHYOLITES

Nine Skukum intrusives were chosen for field study and thirty-three representative samples were collected for petrographic examination. A summary of field and petrographic descriptions of the nine rhyolite intrusives is listed in Table 1.

The field and petrographic evidence, fluorite and tourmaline stockwork, breccia pipes, roof pendants, spherulites and miarolitic cavities in the rhyolites suggest that they were emplaced at a high level. The intrusives display similar modal mineralogies consistent with rhyolite and minor dacite. Petrographic variations include flow banding, perthitic overgrowths and porphyritic, spherulitic, graphic, microlitic, aphanitic, vitric and allotriomorphic granular textures that can be explained by variability in the rate of crystallization, temperature and composition (see Figures 4 a-n). Evidence of rhyolitic and andesitic magma mixing is also present (see Figures 5 a-d).

CHEMISTRY

Table 2 is a list of geochemical analyses for major and trace elements and calculated CIPW norms for nineteen representative samples of the nine Skukum rhyolites. Relatively low CaO, MgO, high SiO_2 and anomalously low Sr concentrations indicate that the rocks were derived from a highly differentiated magma. Ac-

TABLE 1

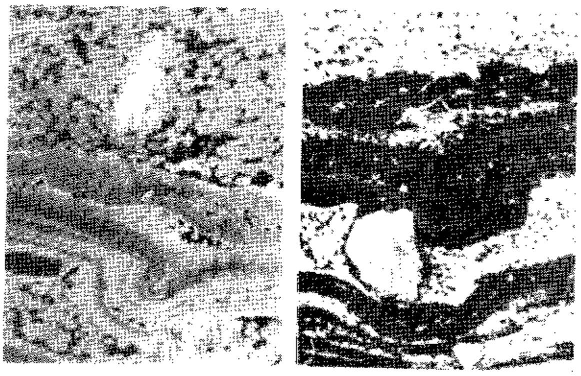
NAME:	IDAHO	FOLLE	GOLD	CARBON
SIZE:				
Height:	-305 m	-610 m	-366 m	-427 m
Area:	-less than 1 km^2	-5 km^2	-2 km^2	-1.5 km^2
Upper Elevation:	-1568 m	-2012 m	-1737 m	-1783 m
CONTACT:	-intrudes Jurassic greywacke, arkose and conglomerate	-Cretaceous granitic rocks and minor volcanic rocks of unknown age to the east	-intrudes primarily Cretaceous quartz diorite and minor amounts of Triassic metasedimentary rocks	-contact to the east with Cretaceous granodiorite, to the northwest with Jurassic and Cretaceous sedimentary rocks and to the southwest with volcanic rocks of unknown age
STOCKWORK	-	-quartz stockwork throughout the northwest area	-	-local weak quartz stockwork
BRECCIA PIPE:	-southern contact is brecciated and associated with arsenopyrite mineralization	-2 m diameter breccia pipe contained altered pale green clasts held together by a quartz matrix (honeycomb texture)	-	-
ROOF PENDANTS:	-does not surface and is overlain by Jurassic sedimentary rocks	-	-Pendant of quartz diorite capped the main intrusive and a small pendant of recrystallized limestone was also found	-several roof pendants of variable composition and size
SPHERULITES:	-present	-	-	-spherulitic
CAVITIES:	-	-present	-	-present with late stage quartz crystals growth towards the center of the cavity
INCLUSIONS:	-	-	-	-
FLOW BANDING:	-found along contacts	-	-locally along contacts	-flow banding is locally present along the contacts
ALTERATION:	-chlorite pseudomorphic after mafic phenocrysts	-the rock is vuggy and has saussurite, sericite, chlorite alteration	-chlorite, calcite, fluorite	-moderately argillically altered pyrite, calcite, late stage quartz
PETROGRAPHY:	-glassy, aphanitic to spherulitic rock with plagioclase and some K-feldspar phenocrysts	-the rock is aphanitic containing varying amounts of quartz, feldspar, biotite and hornblende phenocrysts-groundmass is graphic microlitic to allotriomorphic granular	-fine-grained to aphanitic microlitic rocks containing plagioclase and K-feldspar phenocrysts	-locally porphyritic containing mostly feldspar and rare embayed quartz phenocrysts; matrix is allotriomorphic granular microlitic to spherulitic
MINERALIZATION:	-arsenopyrite occurs disseminated, in veins and as a matrix in the breccia at the southern contact in the rhyolite and conglomerate	-at the upper northwest contact of the rhyolite at Dail Creek, mineralization is pyrite, pyrrhotite, chalcopyrite	-	-antimony showing found at the western margin of the rhyolite with argillized flow banded rhyolite
ASSOCIATED DYKES:	-	-many peripheral associated rhyolite dykes	-	-some peripheral dykes extend away from the stock at the southern margin of the intrusive

TABLE 1 (cont'd)

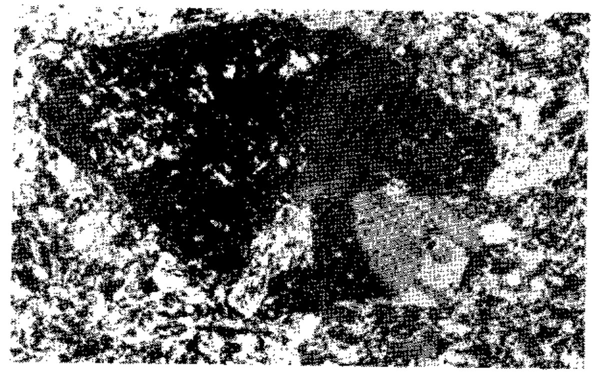
NAME:	CENTRAL	BERNEY	REID	WATSON	PRIMROSE
SIZE:					
Height: Area: Upper Elevation:	-547 m -5 km^2 -2088 m	-427 m -3 km^2 -2042 m	-dyke swarm 180°/70° east to vertical -1756 m	-610 m -1 km^2 -2195 m	-457 m -8 km^2 -2057 m
CONTACT:	-Tertiary volcanic sequence	-Cretaceous granodiorite and minor metasedimentary rocks	-highly deformed Precambrian mica schists and associated with granodiorite to the south; in contact with a barren quartz vein.	-mainly crosscuts Cretaceous granodiorite; to the northeast is in sharp contact with a 9 m wide zone of calc-silicate	-intrudes Precambrian metasedimentary rocks to the north and south, Cretaceous granodiorite and granitic rocks to the west and to the east in contact with Tertiary volcanic rocks
STOCKWORK	-some rare fluorite stockwork formed near the upper contact of the roof pendant; quartz tourmaline stockwork developed in the upper part of the intrusion (moderate)	-	-	-local areas of quartz fluorite stockwork	-traces of open space fillings of tourmaline, calcite and fluorite were found in the talus slope near the not outcrop northern contact
BRECCIA PIPE:	-	-	-	-approximately 3 m in diameter southwest in the rhyolite clasts -country rock and andesite in a feldspar porphyritic matrix	-
ROOF PENDANTS:	-Tertiary andesitic flows	-	-	-	-two blocks of granodiorite within the centre of the intrusion and a small roof pendant; small area of marble near northern contact
SPHERULITES:	-	-present	-spherulite matrix	-	-
CAVITIES:	-	-vuggy cavities present	-vuggy due to leaching	-	-
INCLUSIONS:	-	-	-	-abundant clusters of randomly oriented discs of andesite (mixing of magmas)	-
FLOW BANDING:	-flow banding and autobreccia flow banding at the contacts	-	-flow banding on contact	-rare	-brecciated flow banding along northeast contact with the Tertiary volcanic rocks
ALTERATION:	-weak feldspar alteration to sericite saussurite	-muscovite, sericite, very minor pyrite	-intense argillic alteration at the flow banded contacts - sericite and calcite moderate	-chlorite, calcite, sericite weak alteration	-chlorite, sericite
PETROGRAPHY:	-lithologic and textural variation occur as concentric zones within rhyolite, aphanitic to flow banded at contact crowded porphyry towards center; phenocrysts of embayed quartz, plagioclase, sanidine, patchy perthite, rare pyroxene; felsic groundmass graphic texture	-glomeroporphyritic-phenocrysts of embayed quartz and K-feldspar felsic groundmass has spherulitic to graphic texture	-glomeroporphyritic plagioclase, K-feldspar - and patchy perthite; matrix mostly spherulitic with minor myrmekite and granular allotrimorphic grains	-glomeroporphyritic with phenocryst euhedral plagioclase, K-feldspar, embayed quartz; felsic graphic texture matrix	-homogeneous body of crowded porphyry; anhedral to subhedral crystals of sanidine, plagioclase and embayed quartz, pseudomorphs of amphibole are present closer to contact; matrix shows pilotaxitic to flow banded textures closer to the contact; matrix felsic-fine-grained allotriomorphic granular texture
MINERALIZATION:		-	-	-trace molybdenite -fluorite-bearing samples contained 920 ppb gold	
ASSOCIATED DYKES:	-	-	-	-	-

TABLE 2

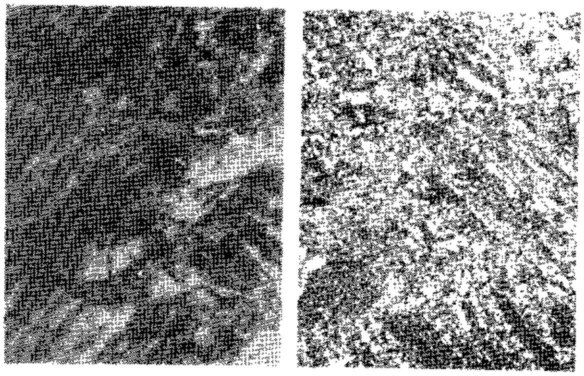
SAMPLE	X-36	101	E-16	X-19	105	86	87	L	48	51	52	76	67	14	15	108	53	57	59
MAJOR OXIDES [weight percent]																			
SiO_2	76.51	74.47	77.90	68.04	74.89	76.64	76.77	76.51	77.18	76.86	75.81	77.84	77.67	73.56	71.92	74.59	66.35	76.11	78.62
Al_2O_3	13.64	13.49	12.92	14.86	13.69	13.69	13.49	13.57	12.92	12.99	12.57	12.78	12 35	13.39	15.42	12.68	14.59	12.62	12.78
Fe_2O_3	1.46	1.82	1.05	3.38	1.62	1.64	1.41	1.68	1.30	1.48	1.43	0.73	0.78	2.10	1.97	1.05	3.75	1.44	1.77
MgO	0.12	0.12	0.09	0.47	0.03	0.06	0.10	0.05	0.01	0.08	0.03	0.03	0.02	0.05	0.07	0.08	0.45	0.06	0.16
CaO	0.49	0.49	0.19	1.60	0.52	0.11	0.05	0.06	0.23	0.24	0.31	0.07	0.05	0.36	0.09	0.24	1.56	0.37	0.58
Na_2O	4.17	3.87	3.09	3.94	4.47	3.49	2.87	3.47	4.02	4.37	4.36	2.20	3.66	4.44	6.46	3.70	4.70	4.12	2.85
K_2O	4.05	5.12	5.09	4.39	4.94	4.54	4.91	4.41	4.87	4.62	4.72	5.61	4.48	4.76	3.20	4.68	3.60	4.80	3.66
TiO_2	0.05	0.13	0.10	0.33	0.08	0.07	0.08	0.07	0.08	0.06	0.06	0.13	0.07	0.11	0.12	0.07	0.33	0.08	0.10
P_2O_5	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
MnO	0.05	0.09	0.00	0.05	0.05	0.04	0.01	0.07	0.00	0.01	0.03	0.00	0.00	0.13	0.01	0.00	0.10	0.01	0.05
TOTAL	100.79	99.84	100.56	97.47	100.44	100.41	99.83	100.02	100.70	100.82	99.40	99.50	99.16	99.17	99.48	97.20	95.81	99.72	100.69
MINOR ELEMENTS [parts per million]																			
Ba	1454.	1290.	595.	1839.	488.	583.	663.	537.	150.	85.	16.	54.	33.	608.	1014.	146.	2171.	219.	230.
Cr*	20.	20.	20.	20.	30.	30.	30.	20.	20.	30.	20.	20.	20.	60.	30.	30.	30.	30.	30.
Zr	86.	147.	114.	206.	175.	114.	146.	124.	139.	140.	137.	316.	141.	209.	244.	152.	264.	130.	131.
Sr	109.	98.	27.	249.	60.	30.	30.	110.	0.	0.	0.	7.	0.	22.	54.	7.	243.	18.	49.
Rb	121.	183.	183.	136.	161.	136.	151.	131.	173.	147.	147.	230.	161.	143.	95.	138.	86.	185.	170.
Y	9.	30.	26.	26.	36.	29.	25.	28.	29.	34.	34.	44.	35.	38.	36.	48.	25.	36.	55.
La	69.	83.	62.	57.	84.	81.	78.	71.	63.	73.	79.	126.	57.	89.	65.	89.	61.	80.	69.
Zn	207.	97.	37.	45.	77.	52.	87.	91.	79.	95.	88.	61.	50.	529.	173.	101.	126.	76.	98.
Ni	12.	1.	8.	0.	3.	17.	1.	3.	10.	9.	16.	0.	0.	3.	13.	18.	0.	9.	7.
NORMATIVE COMPOSITION [weight percent]																			
Q	35.25	31.24	39.71	24.90	28.72	38.51	41.13	39.27	34.41	32.87	32.03	43.62	39.44	28.95	21.93	35.53	21.72	33.01	46.23
C	1.49	.69	1.97	.93	.04	2.82	3.37	2.98	.61	.36		2.97	1.40	.28	1.17	1.12	.18		3.06
OR	23.78	30.41	29.97	26.78	29.13	26.78	29.13	26.11	28.62	27.13	28.10	33.38	26.74	28.45	19.05	28.51	22.36	28.50	21.53
AB	35.02	32.87	26.03	34.37	37.71	29.44	24.36	29.39	33.78	36.71	37.13	18.73	31.25	37.96	55.00	32.24	41.75	34.99	23.98
AN	2.41	2.44	.94	7.65	2.57	.54	.25	.20	1.13	1.18	.78	.35	.25	1.81	.45	1.23	7.99	1.76	2.86
DI											.16							.06	
EN	.23	.30	.22	1.21	.07	.15	.25	.13	.03	.20		.08	.05	.13	.18	.21	1.18	.12	.40
FS			.58														1.33		
WO											.23								
RU	.11		.11						.12	.06	.04	.14	.08			.08		.08	
MT		.44		2.74	.03	.12		.33						.95	.39		2.79		.34
IL	.10	.25	.02	.65	.15	.13	.01	.13	.07		.05	.01	.02	.21	.23	.01	.66		.19
CR	.31	.02	.03	.01	.02	.02	.02	.02	.03	.03	.03	.02	.03	.13	.22	.03	.01	.04	.02
HM	1.45	1.33	1.05		1.56	1.49	1.41	1.35	1.29	1.47							.05		
AP				.19										.17	.03				
PO									.03										



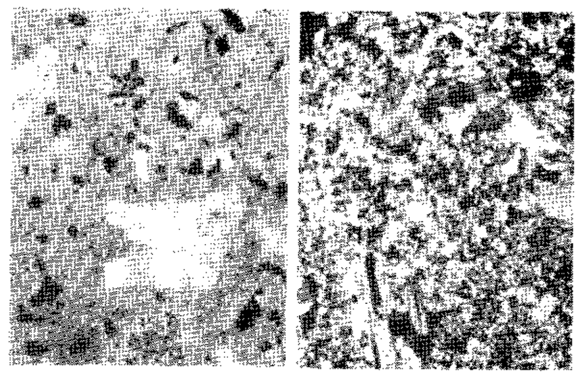
a. Flow banded porphyritic dacite with alternating K-feldspar and spherulite-rich layers; Idaho plug (stained rock specimen at left; thin section under crossed nicols at right).



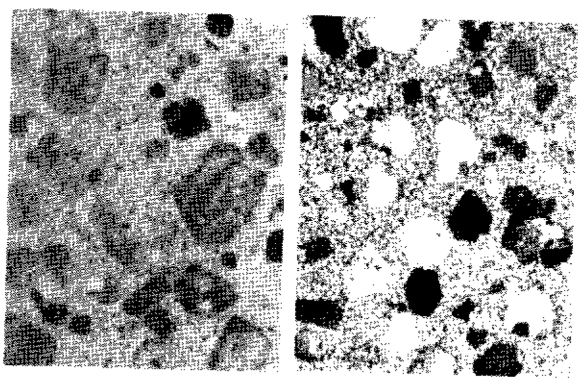
b. Photomicrograph showing pilotaxitic texture with a weak flow fabric subparallel to mafic pseudomorph after amphibole; Primrose plug.



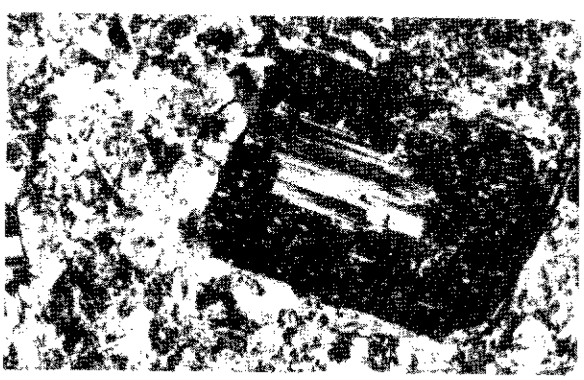
c. Brecciated flow banded rhyolite; Central plug (stained rock specimen at left, thin section under crossed nicols at right).



d. Porphyritic rhyolite with euhedral albite, and minor K-feldspar, amphibole and pyroxene phenocrysts; Folle plug (stained rock specimen at left and thin section under crossed nicols at right).



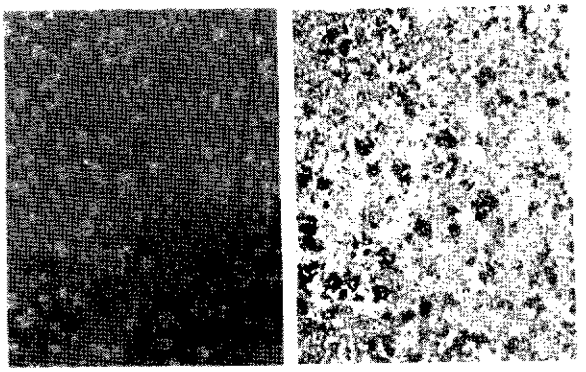
e. Crowded porphyritic rhyolite with embayed quartz, albite and K-feldspar phenocrysts. The albite phenocrysts are surrounded by an overgrowth of K-feldspar; Central plug (stained rock specimen at left, thin section under crossed nicols at right).



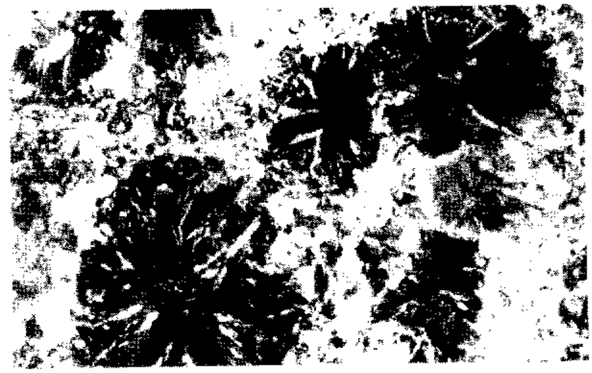
f. Photomicrograph of a plagioclase phenocryst surrounded by a patchy perthitic overgrowth; Reid plug.

Figure 4 a-n

Petrographic variation in Skukum rhyolite plugs.

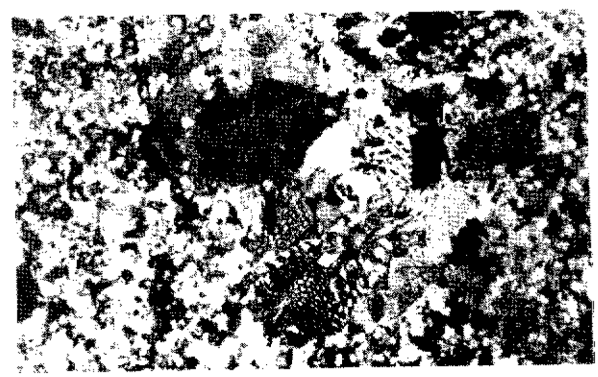


g. Spherulitic rhyolite; Carbon plug (stained rock specimen at left, thin section under crossed nicols at right).

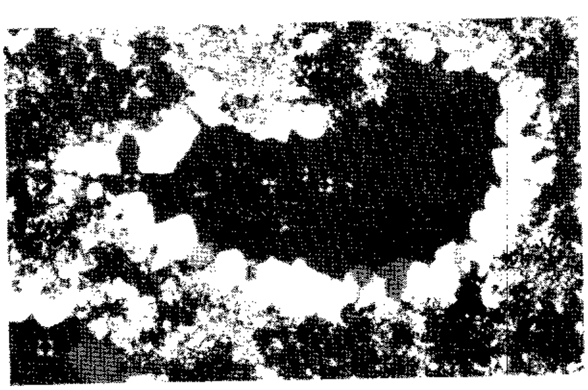


h. Photomicrograph of spherulitic rhyolite; Carbon plug.

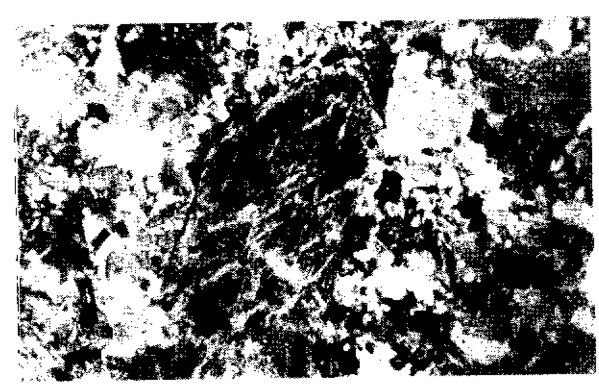
i. Photomicrograph of graphic texture around a feldspar phenocryst; Primrose plug.



j. Photomicrograph of a cluster of graphic texture in a felsic allotriomorphic granular matrix; Carbon plug.



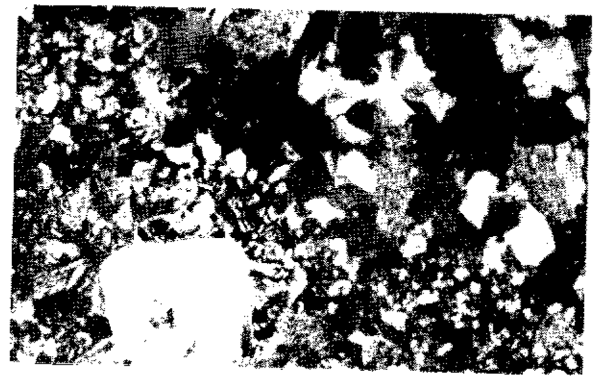
k. Photomicrograph of a miarolitic cavity partially filled with late stage quartz; Carbon plug.



l. Photomicrograph showing propylitic alteration - epidote, chlorite and sericite; Folle plug.

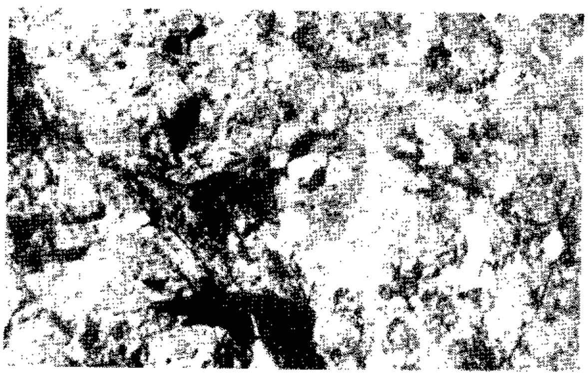
<u>Figure 4, a-n (cont'd)</u>

m. Photomicrograph of microlitic groundmass of felsic composition with phenocrysts of K-feldspar preferentially leached out and replaced by secondary calcite; Carbon plug.



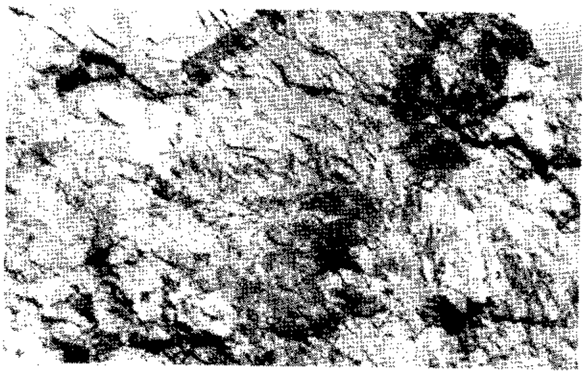
n. Photomicrograph of a cavity partially filled with radiating muscovite crystals; Carbon plug.

Figure 4, a-n (cont'd)



a. A mixture of two magmas - rhyolite and andesite.

b. This photograph shows an andesite dyke intrusive into rhyolite magma. The andesite probably crystallized at a faster rate than the rhyolite and consequently the dyke was fractured in a brittle manner into disc-like fragments of andesite in rhyolite.



c. Folded or crumpled andesite dyke suggests dyke intrusion into rhyolite before complete solidification of the rhyolite.

d. Andesite dyke with angular rhyolite inclusions suggests dyke intrusion into completely solidified rhyolite.

Figure 5, a-d.

Magma mixing in Watson plug.

cording to the Irvine and Baragar (1971) classification scheme, the rocks are calc-alkaline rhyolites of the K-poor series with the exception of two samples, which correspond to the calc-alkaline dacite in the average series.

Harker diagrams for major oxides (CaO, Na_2O, K_2O, TiO_2, Al_2O_3, Fe_2O_3) of the Skukum intrusives are plotted in Figure 6 a and b. SiO_2 content ranges from 64 to 79%. Most of the variation diagrams show negative linear trends with scatter, with the exception of K_2O and Na_2O plots which show considerably more scatter and no obvious linear trends. Harker variation diagrams for trace elements (Figures 7 a and b) show less apparent linear trends with a much higher degree of scatter than the major oxide variation diagrams. Sr, Ba and Zr plots show negative linear trends and Rb shows a positive linear trend. Variation diagrams for Ba and Sr using Al_2O_3 as the abscissa are plotted in Figure 7 c. Both diagrams exhibit positive linear trends with some scatter. A sample from the Central intrusive was chosen for rare earth element (REE) analyses because of its unusually low Sr concentration. The analyses are listed in Table 3. A plot of REE atomic number versus rock/chondrite concentrations is shown in Figure 8. The chondrite -normalized values are relatively low, ranging from 3 to 35 times chondrite. The pattern shows slight light REE enrichment, a large negative Eu anomaly and a slight positive Yb anomaly (the latter probably due to analytical uncertainty).

TABLE 3

Concentrations of REE, Th, Hf and Sc in rhyolite from the Central Intrusive (Sample #48)

ELEMENT	CONCENTRATION (ppm)	CHONDRITE-NORMALIZED VALUES OF REE
La	11.578	35.08
Ce	26.254	29.83
Sm	2.985	16.49
Eu	.203	2.94
Tb	.658	13.99
Yb	3.789	18.94
Lu	.513	15.09
Th	16.970	
Hf	5.635	
Sc	3.195	

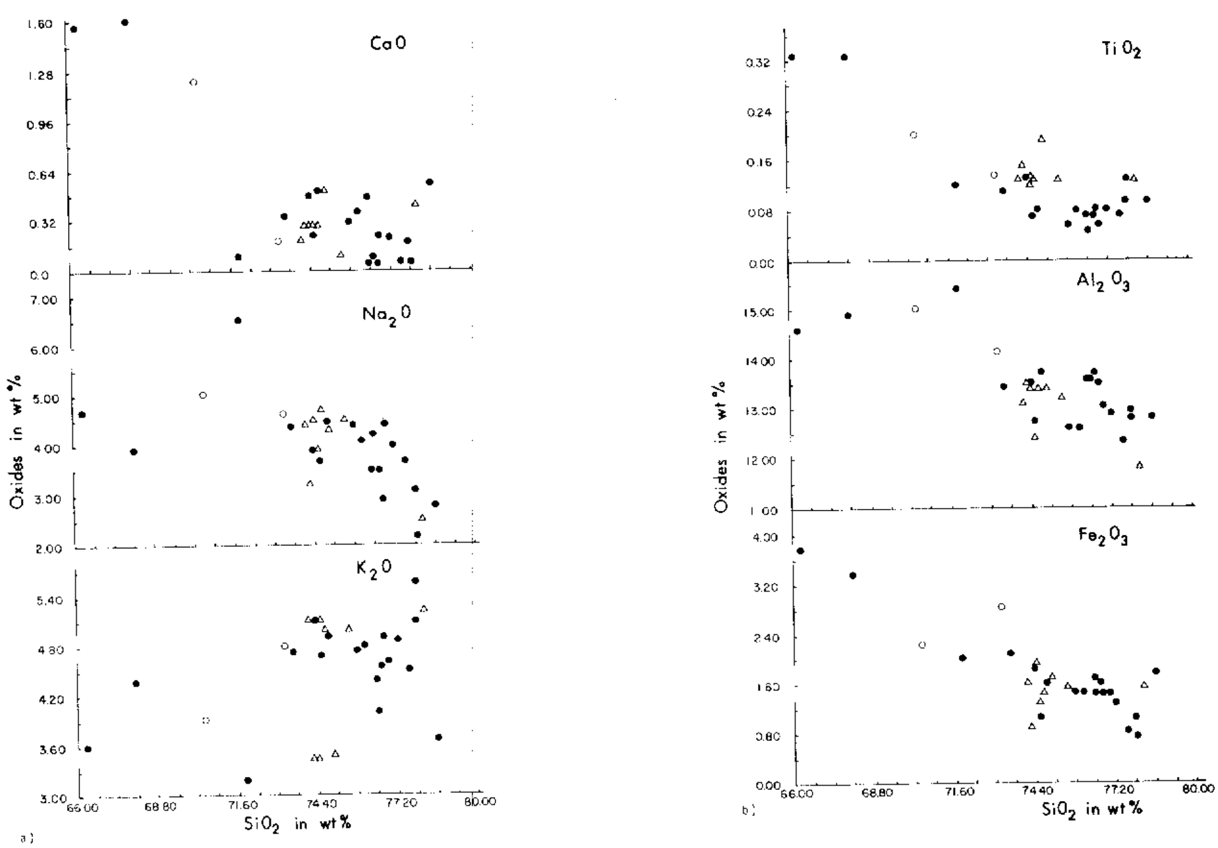
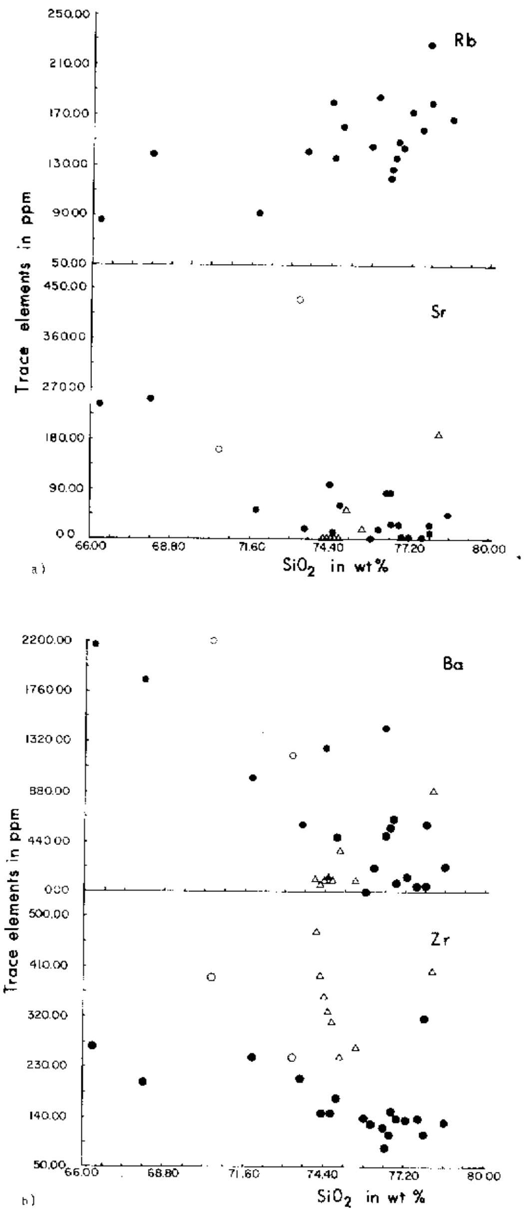


Figure 6 a, b.

Major and minor element oxide Harker diagrams for the Skukum and Bennett Lake intrusives.

Legend for Figures 6 and 7

● Skukum intrusives
△ Bennett Lake associated dykes
○ Bennett lake ring dykes



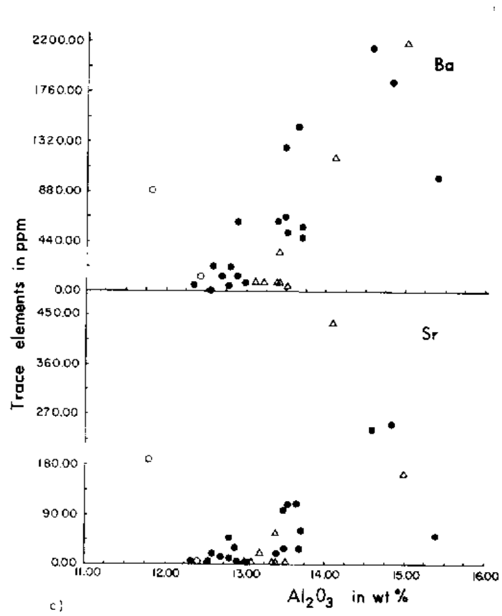


Figure 7 a,b,c.

Trace element Harker and variation diagrams for the Skukum and Bennett Lake intrusives.

CHEMISTRY (INTERPRETATION)

Scatter in the variation diagrams can be attributed to the following: 1) the presence of phenocryst phases contained in most rock specimens; 2) alteration in some samples and 3) the presence of perthitic intergrowths (and hence unmixing) observed in many thin sections, specifically affecting the degree of scatter in the K_2O and Na_2O plots.

The major trends are in accord with the expected trends in a cogenetic suite of igneous rocks; a decrease in Al_2O_3, CaO, Fe_2O_3 and TiO_2 with increasing SiO_2 content. These trends indicate the fractional crystallization of at least two phases, a calcium feldspar and a mafic phase. The Ba and Sr versus Al_2O_3 variation diagrams both show a positive linear trend illustrating the fractionation of both K-feldspar and plagioclase respectively (Hanson, 1978). The REE analyses support the proposed conclusion that the rhyolites are derived by fractional crystallization of feldspar, characterized by the negative Eu anomaly. The low absolute light REE concentrations cannot be explained by major phase fractionation. It can however be explained by the crystallization of minor phases such as fluorite (Deer, Howie & Zussman, 1977), monazite or allanite (Miller & Mittlefehldt, 1982) which tend to concentrate light REE into their crystal lattice. Fractional crystallization can explain the chemical trends

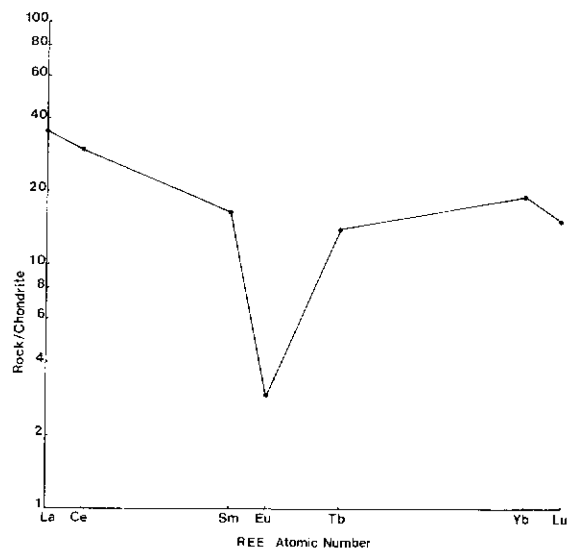


Figure 8.

Chondrite-normalized values of REE for a rhyolite sample (#48) from the Central plug.

TABLE 4

Formation	Dykes								Ring Dyke	
Member										
Specimen No.	29028	30088	49018	49028	49038	53168	5706b8	250218	13147	95017
MAJOR OXIDES (weight per cent)										
SiO_2	74.6	74.1	74.3	75.5	74.7	74.9	74.4	78.2	73.3	70.5
Al_2O_3	12.4	13.1	13.5	13.2	13.4	13.4	13.4	11.8	14.1	15.0
Fe_2O_3	.32*	.8	.33*	1.0	.7	.57*	1.1	.52*		.8
FeO	.88	.7	.47	.5	.7	1.03*	.4	.88*	2.54*	1.3
MgO	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
CaO	.3	.2	.3	.1	.3	.5	.3	.4	.2	1.2
Na_2O	3.9**	4.4	3.25**	4.5	4.7	4.33**	4.5	2.52**	4.59**	5.0
K_2O	5.1	5.1	3.4	5.0	5.0	3.5	3.4	5.2	4.8	3.9
TiO_2	.12	.13	.15	.13	.13	.19	.13	.13	.14	.20
P_2O_5	.05*	.02	.05*	.02	.02	.05*	.02	.05*		.03
MnO	.04	.03	.03	.02	.02	.05	.03	.04	.03	.05
CO_2		.1		.1	.1		.2			.1
H_2O		.4		.5	.4		.4			.4
TOTAL		99.1		100.5	100.5		98.1			99.0
MINOR ELEMENTS (weight per cent except for Pb and Ga in ppm)										
Ba	.012	.0088	.0062	.008	.0081	.034	.0079	.088	.12	.22
Co	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Cr	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Cu	.0062	.0069	.011	.012	.0093	.011	.0071	.0051	.0074	.022
Ga	39	24	50	50	40	15	44	40	46	47
Ni	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Pb	25	19	25	24	21	18	21	31	26	19
Sc	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
Sr	NF	NF	NF	.002	NF	.0052	NF	.019	.043	.016
V	NF	NF	.002	NF	NF	.002	NF	.002	NF	NF
Zr	.033	.047	.039	.027	.031	.025	.036	.040	.025	.039
Normative composition (molecular per cent)[1]										
Quartz	28.977	26.280	39.864	27.435	25.155	32.047	32.580	39.282		21.131
Corundum	.038	.00	4.634	.244	.00	1.88	1.788	1.750		.486
Orthoclase	30.870	30.582	21.101	29.582	29.587	21.014	20.675	31.294		23.320
Albite	35.834	40.052	30.618	40.414	42.219	39.464	41.538	23.021		45.384
Anorthite	1.188	.932	1.219	.431	.688	2.186	1.463	1.686		5.821
Diopside	.00	.004	.00	.00	.362	.00	.00	.00		.00
Hedenbergite	.00	.002	.00	.00	.226	.00	.00	.00		.00
Enstatite	1.413	.698	1.448	.690	.509	1.401	.710	1.405		1.396
Ferrosilite	1.060	.397	.207	.00	.318	1.027	.00	.898		1.270
Forsterite	.00	.00	.00	.00	.00	.00	.00	.00		.00
Magnetite	.342	.848	.581	.194	.732	.605	.749	.553		.846
Ilmenite	.171	.184	.219	.181	.181	.269	.186	.184		.282
Hematite	.00	.00	.00	.088	.00	.00	.289	.00		.00
Apatite	.107	.021	.110	.021	.021	.106	.022	.107		.064
Normative colour index	2.986	2.13	2.456	1.87	2.33	3.302	1.93	3.040		3.793
Normative plagioclase	3.21	2.275	3.822	1.05	1.602	5.26	3.41	6.83		11.37

[1] Norms calculated by the computer at the Geological Survey of Canada using program no. C60901.

(Lambert, 1974).

observed as well as the low Sr concentrations. However, partial melting of an already depleted source rock with residual plagioclase will also explain the patterns observed (Alburquerque, 1977).

DISCUSSION OF SKUKUM AND BENNETT LAKE COMPLEXES

The Bennett Lake complex and Skukum complex represent similar Tertiary volcanic events (Figure 3). Both volcanic complexes may thus be associated with similar magmatic reservoirs. The ring and related dykes associated with the Bennett Lake complex may then display similar petrography and chemistry to the Skukum rhyolite intrusives.

Similar mineralogy and textures are observed in both the Skukum and Bennett Lake rhyolites (Lambert, 1974). The major and trace elements and normative compositions of two ring dyke samples and eight related dyke samples of the Bennett Lake complex are shown in Table 4 and Figures 6 and 7.

Both the Skukum and Bennett Lake rhyolites lie along similar correlation trends with the exception of Zn and TiO_2 which both have significantly higher concentrations in the Bennett Lake complex. The difference in these trace element data are consistent with the hypothesis that the Bennett Lake complex rhyolites were derived from a slightly different fractionating process or magma reservoir than the Skukum rhyolites.

CONCLUSION

Petrographic and geochemical characteristics suggest that the Skukum high level rhyolite intrusives belong to one cogenetic suite of igenous rocks (dacite to rhyolite). This conclusion supports the model that the rhyolites may represent late associated ring fracture intrusions related to a caldera event. Relatively low CaO and MgO and high SiO_2 and anomalously low Sr concentrations indicate that the rhyolites formed from a highly differentiated magma. If the rhyolites are a result of fractional crystallization of a less differentiated magma (dacite), the fractionation of K-feldspar, plagioclase and another mafic phase or accessory phase is needed to explain the observed trends. Partial melting of an already depleted source rock with residual plagioclase may also explain the trends seen. According to the trace element data, the ring and related dykes of the Bennett Lake complex show that they originated from a slightly different fractionating process than the Skukum intrusives.

ACKNOWLEDGEMENTS

I would like to thank Dr. J.A. Morin of Indian and Northern Affairs for suggesting this study as well as providing advice and criticism during its course. I especially thank Dr. C. Pride for supervising my B.Sc. thesis, from which this report is an outgrowth, as well as providing a better appreciation and understanding of the uses of geochemistry. I am also grateful to Jean Lafleur for his support and numerous discussions throughout this study. Lastly, I wish to thank Ron Hartree for his help with the geochemistry lab procedures.

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WHITE CHANNEL GRAVEL OF THE KLONDIKE

D. Tempelman-Kluit
Geology Section
D.I.A.N.D.
Whitehorse, Yukon

INTRODUCTION

The White Channel Gravel of the Klondike is an unconsolidated gravel preserved as erosional remnants lying on rock cut benches above younger streams. It contains important concentrations of gold, and eroded parts of the gravel are the likely source of gold in the newer gravels of streams cut through them (e.g., Bonanza, Eldorado and Hunker Creeks).

The purpose of this note is to point out that the base of the White Channel Gravel and the bedrock below it are altered and that this alteration coincides with the gold localized in the sediments. Groundwater flowing through the gravel may have precipitated the gold and produced the alteration of gravel and bedrock. Previously, gold in the White Channel Gravel has been considered a fossil placer concentration.

Descriptions given here are based on a brief examination of the White Channel Gravel at Dago Hill on Hunker Creek (Figure 1), in the placer workings of Mike Stutter and Ben Warmsby (Figure 2).

The White Channel Gravel was mapped and named by McConnell (1905, 1907) and his descriptions are so complete that no comprehensive study of these gravels has been done since. Gleeson (1970) examined the heavy mineral distribution in gravels of the Klondike, including the White Channel Gravel. Boyle (1979) gives a readily accessible summary of the Klondike district which places the White Channel Gravel in its geological context.

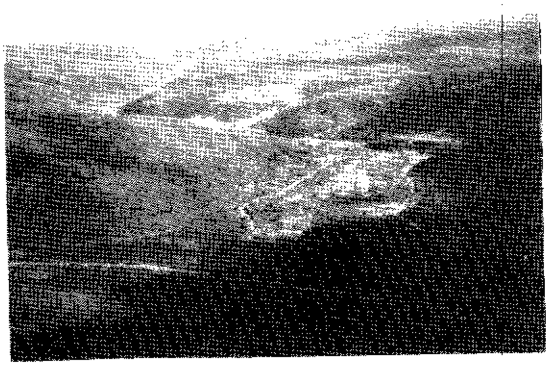

Figure 1

View up the valley of Hunker Creek from above the North Klondike River. Note the rock cut bench visible on the left limit (right side in this view) of the creek. On this bench are 50 m of White Channel Gravel. The modern stream is incised through this fossil gravel deposit. Dago Hill is in the middle distance.

WHITE CHANNEL GRAVEL

The White Channel Gravel at Dago Hill is typical of the unit generally. It is a strikingly uniform deposit of poorly stratified to massive, unsorted gravel and minor sand about 50 m thick (Figure 3). Boulders and pebbles of subangular quartz, slabby boulders of schist and gneiss, and locally boulders of quartz porphyry are enclosed in a matrix of quartz,

Figure 2

Aerial view of Stutter and Warmsby's workings in White Channel Gravel on Dago Hill. The vertical face is of nearly 50 m of White Channel Gravel and the flat surface in the bottom of the pit is the cleaned bedrock surface.

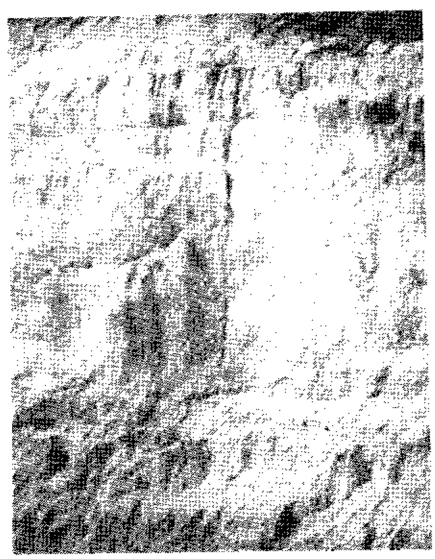

Figure 3

Closer view of White Channel Gravel in the face of the pit on Dago Hill. The view is of 35 m of gravel. Note the poor stratification and the absence of finer-grained members in the massive unsorted gravel.

muscovite and rock fragments (Figure 4). Quartz boulders predominate over the schist and gneiss while the quartz porphyry is only locally important. The gravel is homogenous and generally lacks discrete beds of sand, although sands are locally abundant in the upper

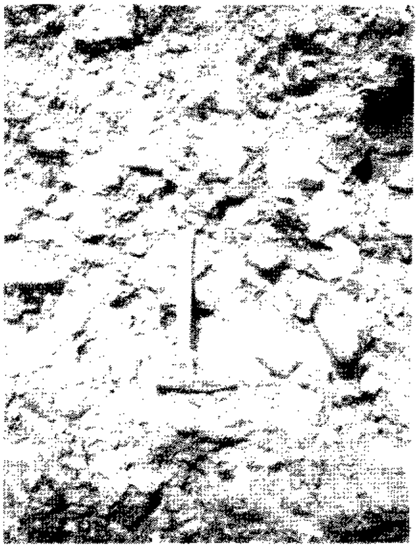

Figure 4

White Channel Gravel is made up of sub-angular quartz and gneiss clasts in a matrix of coarse sand that contains quartz and muscovite. The gravel is not indurated but stands up well because it is permanently frozen.

part. Clasts are locally imbricated, but generally show no preferred orientation. The gravel is dominantly clast-supported. Boulders are generally less than 50 cm across and are moderately- to poorly-rounded.

DEPOSITIONAL ENVIRONMENT

The main facies, horizontally bedded, clast-supported gravel, represents facies Gm of Miall (ed., 1978). Cyclic units, ranging from clast-supported to matrix-supported gravel (facies Gm to facies Gms of Miall), are seen locally, but fining upward sequences, characteristic of more distal or downstream parts of river systems, are rare. The White Channel Gravel represents proximal channel lag and bar deposits of a gravel-dominated braided stream of the Scott type of Miall (ed., 1978). The gravel was laid down near the headwaters of a generally aggrading system because its clasts are locally derived and none are demonstrably more than 20 or 30 km from the source. The concentration of quartz in the White Channel Gravel and the relative underpopulation of the less resistant gneiss clasts indicates slower accumulation rates than present stream gravels.

The valleys in which the White Channel Gravel formed, ancestral Hunker and Bonanza creeks, were about 1.5 km wide near their confluence with the Klondike River and narrowed upstream to about 150 m. Stream gradients were gentler than those of the present streams, (i.e. 1% for the lower 10 km of Bonanza Creek vs. 0.6% for the White Channel over the same stretch). McConnell (1905) mapped remnants of the deposit and his cross-sections (Figure 5) show the relation of the White Channel valley to the younger stream.

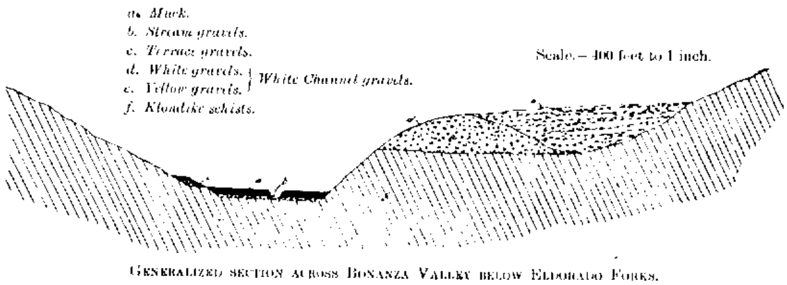

Figure 5

McConnell (1905) worked out the relation of the present stream valley to that in which the White Channel Gravel was laid down. He considered the gold in the White Channel Gravel to be the first fluvial concentration from lodes in the country rocks. The modern streams incised through the White Channel thus contained the second concentrate of gold.

AGE

The White Channel Gravel contains no plant and animal remains. Its age is unknown and only broadly limited stratigraphically. It formed in response to a general rise of base level in the Klondike. This base level rise preceded faulting that produced the Tintina Graben and that rejuvenated streams to initiate downcutting. Normal faulting to produce the Tintina Graben may be Pliocene on the basis of scarp retreat rates (Tempelman-Kluit, 1980). The youngest clasts in the White Channel Gravel are of undated quartz porphyry that is most likely Eocene or younger on the basis of lithologic correlation with similar rocks on Mt. Tyrrell - 50 km to the southwest. The White Channel Gravel is therefore no older than Eocene, no younger than Pliocene and most likely late Miocene or Pliocene.

ALTERATION

Two related features, its white colour and its intense alteration, are unique and remarkable in the White Channel Gravel. The White Channel Gravel contains clasts of the local country rocks as do the present streams, with a moderately higher proportion of quartz, but in the new streams the gravel is medium grey in contrast with the White Channel Gravel. The white colour results partly from the higher proportion of detrital quartz, but also from leaching of some of the dark-coloured constituents. Evidence of leaching by groundwater is preserved in the form of limonite-stained fronts seen locally in the gravel.

Schist, gneiss and feldspar porphyry clasts in the lower five m of the White Channel Gravel are generally altered so that they disintegrate and crumble upon thawing. In contrast, boulders of the same rock types higher in the gravel are hard and resistant and do not disintegrate upon thawing, but can only be broken with a hammer. The alteration is a pervasive replacement by clays of the feldspars and micas in the clasts and matrix of the gravel. Alteration is so complete that schist and porphyry clasts, which must have been hard when deposited, are now soft clay that preserves original fabrics, but which disintegrates upon thawing. The boulders are doughy or pulpy, and when they are hit with a hammer the implement penetrates the clasts instead of breaking them (Figure 6). Boulders of white vein quartz in the gravels of the present streams are hard and difficult to break. The same quartz boulders in the White Channel Gravel commonly disintegrate on the first blow of a hammer. Apparently, they have lost cohesion by removal of minor amounts of silica along crystal boundaries and other incipient fractures. Similar mobilization of quartz from sand-sized quartz grains may have occurred extensively, but is hard to document.

Figure 6

White Channel Gravel at the base of the working face in the Dago Hill pit is strongly altered; feldspars in the gneiss boulders are changed to clays and feldspar in the matrix is similarly altered. The gneiss clasts are so soft, when thawed, that the hammer penetrates the boulders. Further up in the gravel deposit, the same boulders are unaltered and break apart like normal water-worked boulders. Quartz feldspar porphyry boulders show the same penetrative alteration near the base of the White Channel.

The contact between bedrock and gravel is planar and subhorizontal with relief of less than a metre in a hundred metres (Figure 7). The bedrock, for several metres below the White Channel Gravel, is invariably strongly altered and upon thawing it too turns to a soft, incompetent clay for which the term bedrock is inadequate. Where the rock was schist or gneiss, it has become a yellowish mixture of quartz and clay that faithfully retains the fabric and texture of the parent rock until thawed (Figure 8). Where the rock was graphitic quartz schist (Nasina Quartzite), it became a mixture of quartz and graphite without new minerals, but lacking intragranular cohesion so that it breaks down readily upon thawing (Figure 7). Veins of white quartz in the "bedrock" show the same lack of strength seen in quartz boulders of the gravel and break easily when hammered.

Figure 7

This trench through bedrock on Dago Hill exposes the relations between the White Channel Gravel and bedrock. Note that the contact is abrupt and planar with only slight relief. The bedrock below the contact and the gravel above the bedrock are both strongly altered.

The alteration of the White Channel Gravel and the bedrock is an example of the low pH assemblage associated with precious metal vein deposits as an alteration cap (Buchanan 1981, p. 252). Such caps consist of any or all of the minerals alunite, sericite, illite, kaolinite, montmorillonite and other clays and are found above the precious metals in many vein occurrences. The most intense alteration in the White Channel Gravel is along the bedrock-gravel interface in the lower five metres or more of the gravel and the upper two or three metres of bedrock, and the alteration envelope is subhorizontal and follows this contact.

GOLD

Gleeson (1970) showed that gold is restricted to the lower two or three metres of the White Channel Gravel nearly everywhere. He did not test the concentration of gold in the bedrock, but presumed it to be confined to the upper metre or so of bedrock. Gold in the White Channel Gravel ranges from fairly coarse, rough nuggets, flakes and wires to finer particles. Crystalline and feather gold is common (Figure 9), and some gold encloses or includes quartz grains or crystals. Most gold is seen only after processing and recovery, and because of mechanized bulldozer and sluice box techniques of working the gravel the metal is rarely seen in place by the miners. Relations of the gold to its gravel and "bedrock" hosts are therefore speculative. During early hand mining, gold was seen in place, but its relations were rarely described. McConnell (1905, p. 62) mentions a boulder, in gravels that are probably coeval with the White

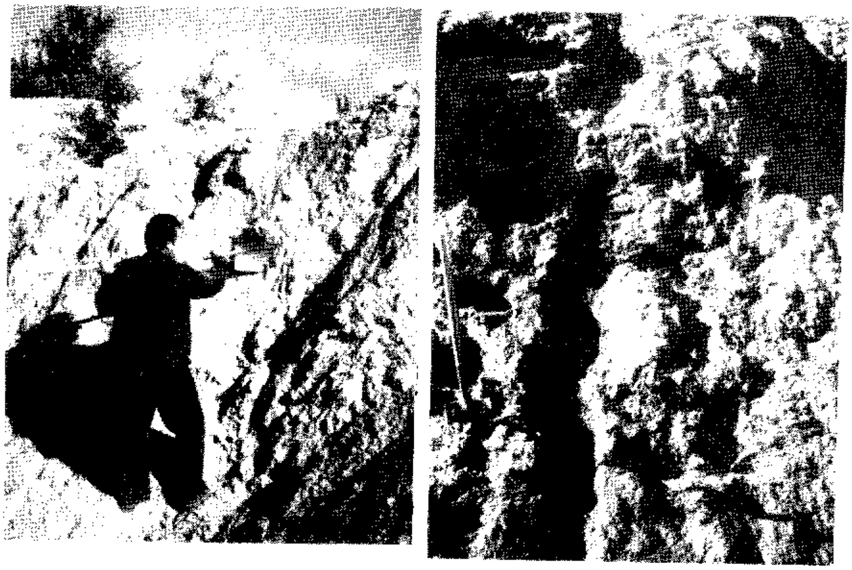

Figure 8

"Bedrock" that forms the bench beneath the White Channel Gravel is strongly altered. Although bedrock structures, textures and fabrics are preserved, the "rock" is so extensively altered by clay replacement of feldspars and by quartz dissolution and reprecipitation that it has no cohesion. These two views illustrate the disaggregation.

Figure 9

Crystalline gold makes up a good proportion of that recovered from the White Channel Gravel on Dago Hill. This is a photograph of some of the finer material on a lens cap that is about 5 cm across.

Channel Gravel and seen in workings on upper Miller Creek, that was coated with dendritic gold.

GOLD CONTENT OF BEDROCK

Some 50 standard channel samples were taken and assayed to test the gold content of the altered bedrock and two samples of the altered gravel were taken for comparison. Each type of "bedrock" was sampled, including white bleached types, limonite or manganese-stained varieties as well as black-graphitic kinds. Samples weighed about four kg each. The samples were taken from the workings on Dago Hill so that only freshly exposed material was collected. Even so, the "bedrock" was first scraped with a shovel to preclude contamination. The "bedrock" samples are of the clayey altered material from depths a few centimetres to 10 metres below the gravel-bedrock surface, although most are from within three metres of the surface. Of the 50 "bedrock" samples, 36 returned undetectable amounts of gold, the detection limit being five ppb. Of the remaining 14 samples with detectable gold, the highest had 305 ppb and others in decreasing order: 90, 40, 25, 20, 15, 15, 15, 15, 10, 10, 10, 5, 5 ppb. Of 28 samples from white clayey bedrock, i.e. altered Klondike Schist, all but three returned undetectable gold. Two limonite-stained clayey samples out of 10 returned values above detection limits; this includes the 305 ppb sample. Out of 12 samples of the graphitic rocks, nine returned values above the detection limit, and it seems this rock type, rather than the degree of alteration, is related to the gold distribution.

The two samples of altered gravel were from the lower 60 cm of the White Channel Gravel immediately above "bedrock". Quartz boulders and cobbles were removed from the sample so only clayey and sandy material was assayed. It was expected that these samples would return the highest gold values because the lower part of the White Channel Gravel is normally considered the best pay. Instead, one sample returned 45 ppb, the other less than 5 ppb.

Two conclusions are possible from these results. First, the low results may reflect the absence of gold in bedrock and gravel sampled, either because the rocks sampled have anomalously low values or because these rocks have generally low values. Alternately, the low results may not accurately reflect the gold content of the rocks because the samples are unrepresentative or because the analytical method was not adequate. Because sampling was done over a large area, from which gold is actively being recovered, the first conclusion is unlikely. Most probably, the standard method of assaying whereby the sample is quartered several times after grinding and only a small fraction is analyzed is an inadequate method of treating such samples. Instead, a method whereby the entire sample is assayed may be more appropriate.

MODEL FOR ALTERATION AND GOLD PRECIPITATION

The bleaching, replacement of feldspars by clay, and silica removal from parts of the White Channel Gravel and the "bedrock" are products of alteration, probably by groundwater that flowed through the White Channel Gravel above bedrock. This alteration probably began while the gravel was deposited and continued until the sediments froze in the Pleistocene. The effects of the alteration were probably concentrated at the bedrock-gravel interface because water flow was concentrated there. Alteration may be expected anywhere in the gravel where groundwater flowed.

Because the gold is confined to the most strongly altered part of the White Channel Gravel, a genetic relationship between the alteration and the gold seems inescapable. This implies that the gold was deposited from the same groundwater that altered the rocks, and that this gold is a near-surface, low-temperature deposit formed about the Pliocene. McConnell (1905) considered the bulk of the gold in the modern stream gravels to be a placer concentrate derived largely from quartz veins in the country rocks. Boyle (1979) thought that the gold of the present stream gravels had been successively concentrated from the quartz veins, first, in the oxidized zones of these veins, second, in the White Channel Gravel and finally, in the new streams. Both authors implicitly considered the White Channel gold a fossil placer.

The groundwater system speculated here for gold deposition probably had two components (Figure 10). A part of the precipitation percolated into the country rocks to form the general groundwater system. This groundwater reacted with pyrite in the country rocks to become acid, and it dissolved gold from the country rocks. Gold content in the water may have been improved by circulation of the groundwater to depths sufficient to warm it. The remaining surface precipitation flowed along the surface toward valleys where it formed streams. Some of this water percolated into the White

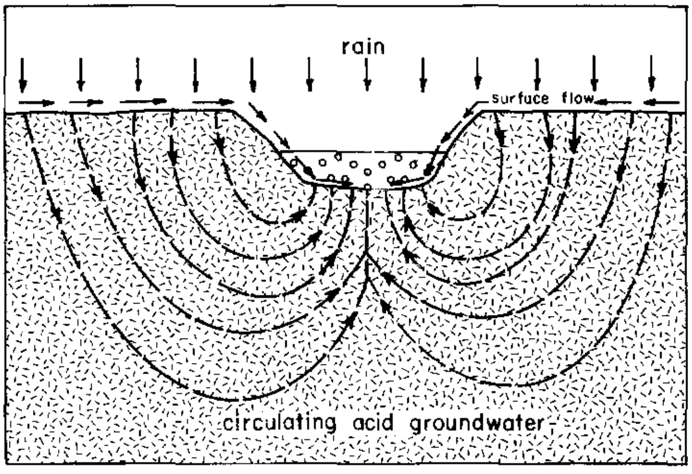

Figure 10

Cross-section of the valley in which the White Channel Gravel was deposited, to illustrate how the gold and the alteration may have been concentrated from groundwater at the gravel-bedrock interface. Surface precipitation splits into two parts. The first percolates through cracks to become part of a normal groundwater cell that rises to surface in topographic lows. This water dissolves gold from the country rock and carries it perhaps as cyanide, chloride or thiosulphide complexes, all of which are common in nature. Water that does not percolate through the rocks flows along the surface and through the permeable gravel. This second water flow is so rapid that its chemistry remains normal. The two currents move under the valley at the permeability contrast between gravel and bedrock and here the surface flow buffers the gold-carrying stream, causing precipitation of gold, alteration of feldspar and mobilization and redeposition of silica.

Channel Gravel. Upon return to the surface, the deep groundwater, now a gold-bearing, more acid fluid, perhaps somewhat warmed, mixed with the cooler, aerated, normal pH water flowing through the gravel near surface. Mingling of the two underground streams occurred at the White Channel - bedrock interface, because much more water flowed through the gravel than through the bedrock so that the deep circulating regime was overwhelmed by the surface flow. Mixing buffered the deep circulating water, precipitating its gold and forming the alteration.

IMPLICATIONS

If the gold and the alteration of the White Channel Gravel are genetically related, and if groundwater was responsible for both as suggested here, ideas about gold-bearing gravels need to be reexamined. The process postulated here does not require the presence of high-grade lode sources for the gold. In the Klondike, lode sources are notoriously few. This mechanism does require an adequate suppy of gold in the country rocks, but such a supply exists nearly everywhere as gold is widespread in low concentrations. The process requires sufficient time for gold to be mobilized from a relatively large volume of country rock to the vadose zone, and this depends on the rate of groundwater flow and amount of gold carried in solution. Little is known of flow rates, but there appears to be plenty of time. High rates of groundwater flow and high gold solubility may be more important to transport the gold than high background gold concentrations in the country rocks. Gold solubility is affected by the chemistry of the transporting medium, fluid-residence time and by the temperatures of the fluid.

In the process postulated, it appears that most factors occur commonly. Thus, the groundwater flow pattern is not unique, nor are source rocks with background gold concentrations uncommon. Therefore, gold must be transported and deposited from groundwater commonly, if this mechanism operates at all. What factors then determine whether gold will be deposited in economic concentration? One is that deposition must occur in a sufficiently narrow zone to effect concentration. This can be done where a well-defined porosity and permeability contrast exists to confine the zone of buffering and therefore deposition. Another factor is to let the process operate long enough without change in the flow rates so that deposition will occur in the same place. It is conceivable, for example, that the precipitation site might shift constantly with changes in the groundwater flow rates resulting from variation in the amount of surface fluid input and modification of the permeability of the rocks. Such shifting of the depositional site will effect only a redistribution, but not a concentration of the gold.

A groundwater system, such as that under consideration, may also produce lode gold occurrences. Wherever circulating groundwater that has picked up gold enroute returns to surface, is a target for precipitation. To effect deposition, it is necessary to reduce the gold solubility in the transporting fluid, and this could be done by flooding it with neutral water or otherwise changing the chemistry. For example, if groundwater carrying gold flowed toward a fracture or a set of fractures, the openings could become the locus for precipitation and alteration if the solution carrying the gold is sufficiently buffered in the fracture (perhaps by neutral water flowing through it directly from the surface). Some Klondike lode occurrences, like the Lone Star and Violet, which have notoriously erratic gold distribution, may have formed this way. Underneath the regolith of soil and broken rocks that mantle hillsides are other potential targets for deposition, and topographic lows are particularly favoured in this instance.

The process postulated here may have operated to deposit the gold known in other bench gravels of the Klondike Plateau, such as those above Henderson, Black Hills, Thistle, Kirkman, Scroggie and Barker creeks and on the Sixtymile and Indian rivers.

Whether gold continues to precipitate from groundwater in the new streams of the Klondike is unknown, but the bulk of the gold mined from the modern creeks was probably placer gold derived from the eroded White Channel Gravel, with possibly a minor proportion of "electroplated" gold deposited for the first time.

Gold may be "growing" in gravels elsewhere, even in creeks from which there is no known production and in which gold has not yet been found. The process postulated precipitates gold at distinct sites below the surface and may not deposit the metal close enough to the surface to be detected in prospecting with a pan. Particularly favourable for prospecting are creeks with a considerable thickness of gravel through which water flow might be concentrated in a zone, normally at the base. Many Klondike streams satisfy this condition, but have not been adequately tested near bedrock because of the difficulty of getting down to the base of the gravel. Some streams that appear to satisfy the conditions of the model are left-limit tributaries of White River, like Katrina, Kennebec, Calidonia and O'Brien creeks.

ACKNOWLEDGEMENTS

The writer is indebted to Mike Stutter and Ben Warmsby for an introduction to Dago Hill and for free run of their ground to study and sample the White Channel Gravel and bedrock. Grant Abbott provided a clue to the model proposed here during discussions in the early stages of this study.

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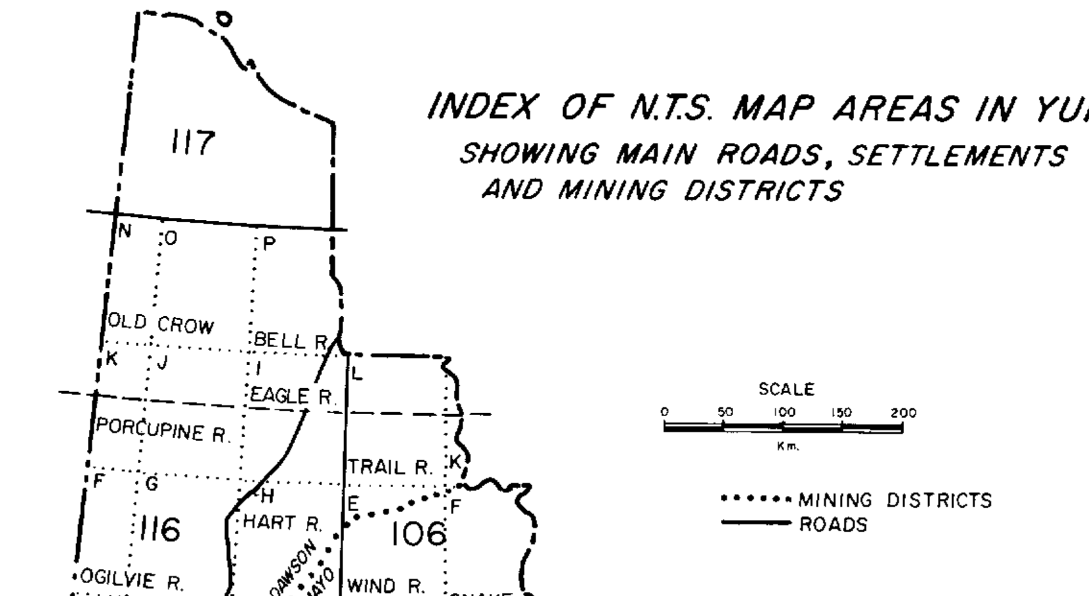
INDEX OF N.T.S. MAP AREAS IN YUKON
SHOWING MAIN ROADS, SETTLEMENTS AND MINING DISTRICTS
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0 50 100 150 200
Km.
MINING DISTRICTS
ROADS
117
116
106
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OLD CROW
BELL R.
EAGLE R.
PORCUPINE R.
TRAIL R.
HART R.
WIND R.
OGILVIE R.
SNAKE
BONNET PLUME L.
DAWSON
LARSEN CR.
NASH CREEK
NADALEEN
STEWART R.
MAYO
NIDDERY LAKE
SEKWI Mtn.
McQUESTEN
LANSING
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SNAG
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SHELDON LAKE
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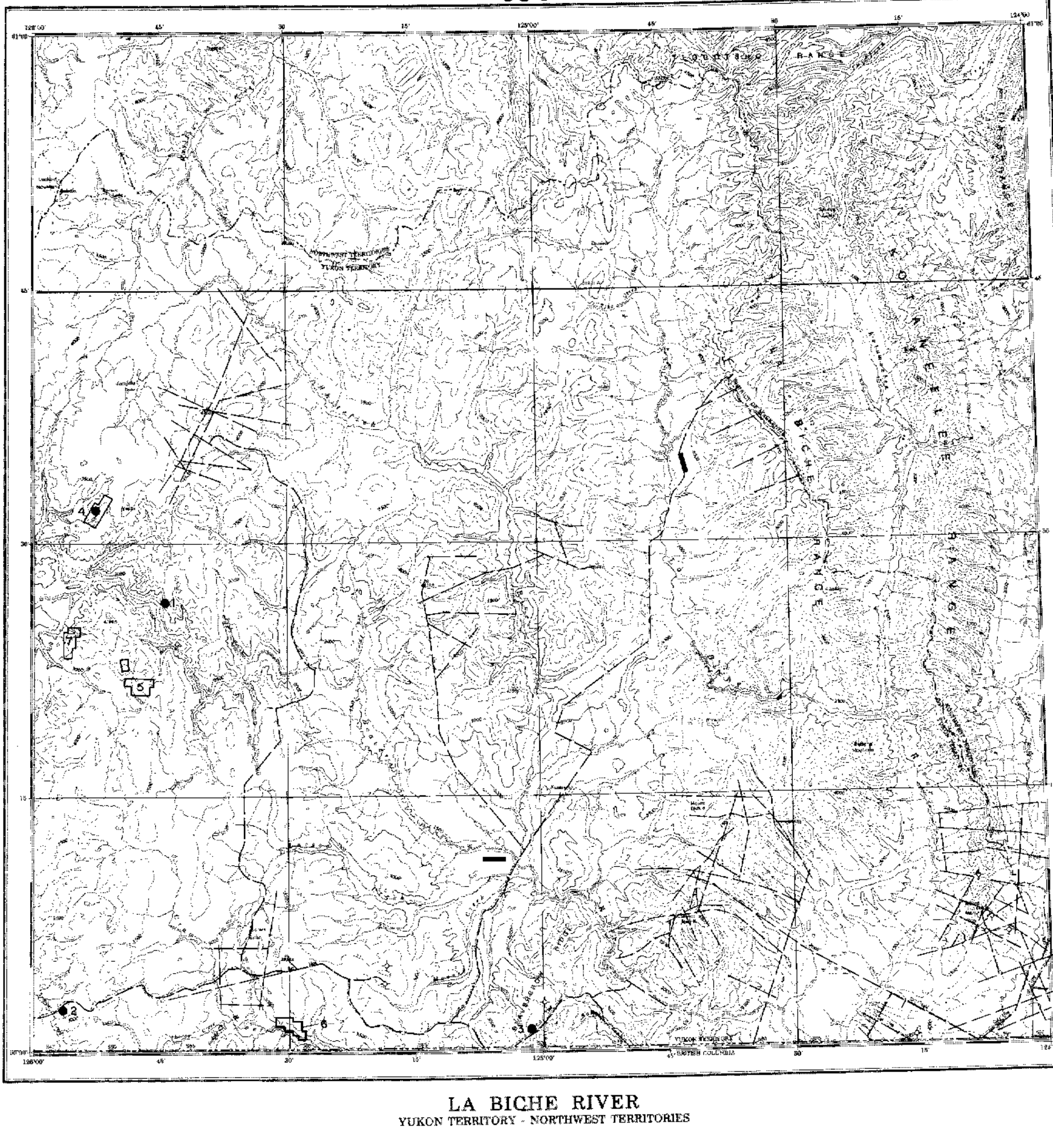
MOUNT ST. ELIAS
WHITEHORSE
WOLF LAKE
WATSON LAKE
COAL RIVER
LA BICHE RIVER
DEZADEASH
TESLIN

SUMMARIES OF ASSESSMENT WORK, DESCRIPTION OF MINERAL PROPERTIES, AND MINERAL CLAIMS STAKED IN 1981

The reports and summaries of work done are keyed to a set of maps which are reductions of the 1:250,000 topographic maps of Yukon. The maps show three features in relation to the topography. They include the location of known mineral occurrences with a key naming them. The key also gives the most recent literature reference describing the occurrence. The maps also show the areas covered by mineral and placer claims in good standing and the areas covered by leases to prospect for placer and coal. Mineral claims staked during 1981 are distinguished from those located earlier to emphasize areas that will focus future exploration. The claim information derives from the maps of the Supervising Mining Recorder, D.I.A.N.D., Whitehorse. Finally, the maps indicate secondary access roads and winter tote trails.

The maps are ordered according to the National Topographic System and the work summaries and records of new staking also follow this order. Thus, each map precedes a section describing exploration activity within that area. Each report on a property includes the National Topographic System reference number keying it to the relevant 1:50,000 scale map-area. The number beside the NTS relates to the property location on the index map. Latitude and longitude further define the location. The name reported is that given by the original discoverer or staker; it may not match that of the present claims. Repetition of names is avoided by assigning a unique name where the claim name is not diagnostic.

95C



LA BICHE RIVER
YUKON TERRITORY - NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ● 61 .... Mineral Deposit or Occurrence see key on facing page
- ○ 72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan 1982) and staked before Jan. 1981
- ...... Mineral Claims staked in 1981
- ..... Prospecting Leases in good standing (April 1982)
- ..... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- ..... Tote Trail
- ..... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

LA BICHE RIVER MAP-AREA (NTS 95 C)

General Reference: GSC Map 1380A by: R.J.W. Douglas, 1976.

NO.	PROPERTY NAME	REFERENCE
1	POOL	Barium Vein Occurrence
2	TROPICAL	Barium-Lead-Zinc Occurrence
3	BEAVERCROW	D.I.A.N.D. Files, Log of SOBC Shell Beavercrow Well K-2 (Drilled 1963)
4	TING	D.I.A.N.D. (1981, p. 131)
5	VISTA	This Report
6	DUFFY	This Report
7	THOR	This Report

VISTA
Silver Standard Mines Limited;
E and B Explorations Limited;
Welcome North Mines Limited;
Malabar Silver Mines Limited

Unmineralized Target
95 C 5 (5)
(60°23'N,125°50'W)

References: D.I.A.N.D. (1981, p. 131).

Claims: KID 1-8; VISTA 1-16; SID 1-6

Source: Summary by P. Watson from assessment report 090872 by D.G. Leighton.

Current Work and Results:

During 1980, 44 m of IEX boring, in 12 holes, was completed to test the bedrock below altered radioactive showings at the surface on the KID claims. Core was logged radiometrically in the field, rather than assayed.

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THOR
E and B Explorations Limited;
Silver Standard Mines Ltd.;
Welcome North Mines Ltd.;
Malabar Silver Mines Ltd.

Lead, Zinc
95 C 5 (7)
(60°25'N,125°56'W)

Claims: THOR 1-22

Source: Summary by P. Watson from assessment report 090846 by R.R. Culbert.

Description:

The THOR claims were staked in 1980. They are underlain by lower Paleozoic sediments that have been intruded by a mainly syenitic alkaline complex. Several faults cut through the area. A large belt of impure limestone and limy argillites occurs west and northwest of the syenite intrusion and contains some scattered Pb-Zn mineralization.

Current Work and Results:

Approximately 120 geochemical samples were collected, including stream sediment, soil and rock samples. Analyses for U, Th, Pb and Zn were reported.

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1981 MINERAL CLAIMS STAKED

DUFFY
J. Legare et al

95 C 3,4 (6)
(60°01'N,125°29'W)

Claims 1981: DUFFY (6); ROD (3); TRACY (4); KATHY (6)

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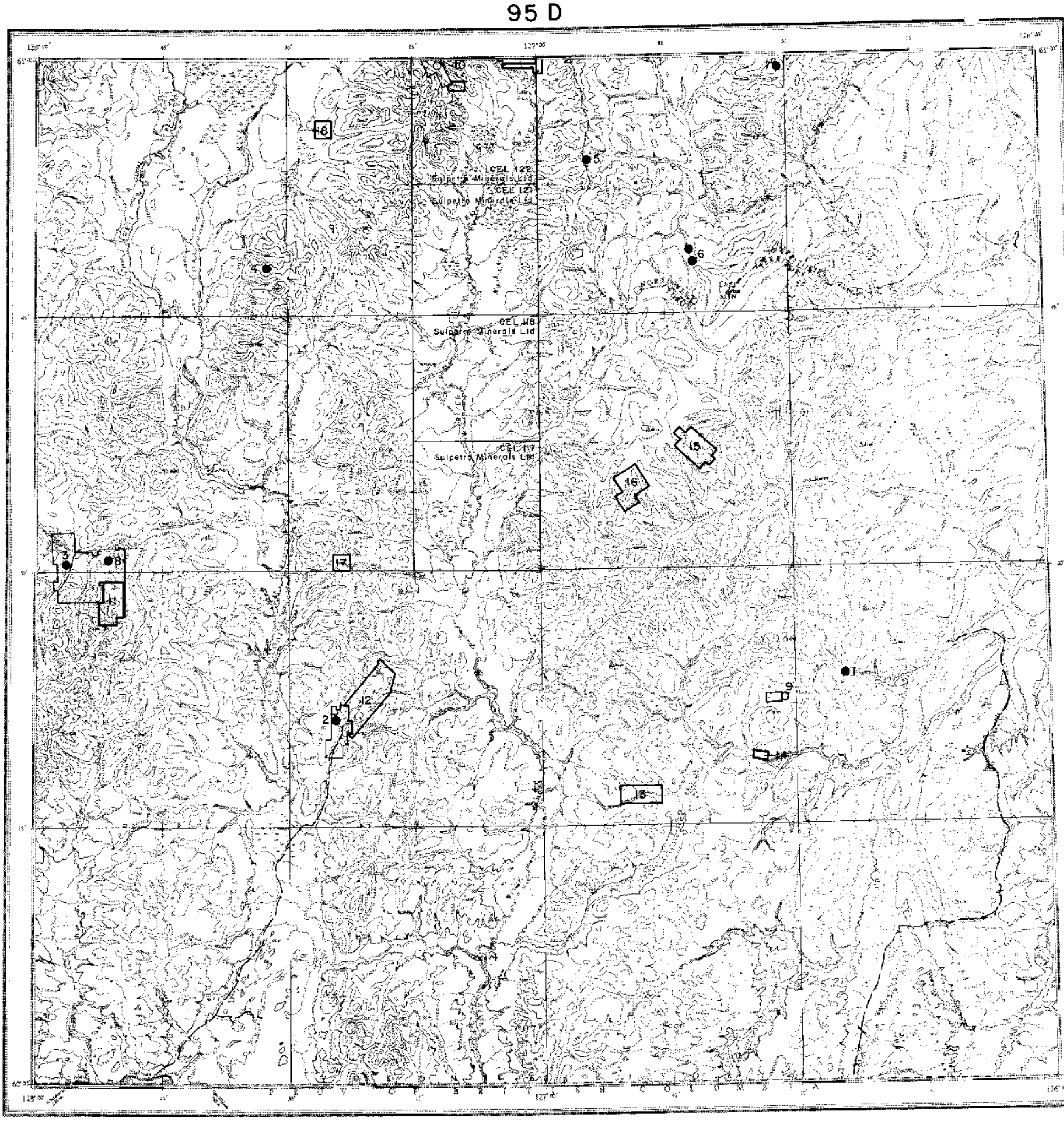
95 D



COAL RIVER

YUKON TERRITORY — NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page	..... Prospecting Leases in good standing (April 1982)	..... Tote Trail
○72 .... Unmineralized Target	..... Placer Claims in good standing (April 1982)	..... Driveable Road
...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL .... Coal Exploration Licence	.... Oil or Gas Well
..... Mineral Claims staked in 1981	CML .... Coal Mining Lease	.... Airstrip

COAL RIVER MAP-AREA (NTS 95 D)

General Reference: GSC Map 11-1968 by: H. Gabrielse, 1969.

NO.	PROPERTY NAME	REFERENCE
1	GUSTY	Gabrielse & Blusson (1969, p. 16)
2	MEL	This Report
3	McMILLAN	This Report
4	CHU	Skarn Lead-Zinc Occurrence
5	GABE	Gabrielse & Blusson (1969, p. 16)
6	LAST	Lambert (1969, p. 21-23)
7	STONEMARTEN	Lambert (1969, p. 21-23)
8	PORKER	D.I.A.N.D. (1981, p. 105)
9	WOLF	This Report
10	SPORK	D.I.A.N.D. (1981, p. 133); This Report
11	CUZ	This Report
12	HOSER	This Report
13	LOOTZ	This Report
14	JT	This Report
15	OUDDER	This Report
16	DK	This Report
17	STAR	This Report
18	HERPES	This Report

MEL
Sulpetro Minerals Limited;
Sovereign Metals

Zinc, Lead, Barite
Stratiform
95 D 6 (2)
(60°21'N,127°24'W)

References: D.I.A.N.D. (1981, p. 133); Morin et al (1979, p. 74; 1980, p. 50).

Claims: MEL, JEAN, WET, SOV (59)

Current Work and Results:

This stratiform sphalerite, galena, barite deposit occurs at the top of Lower Cambrian limestone (locally dolomite). It is 800 m long by up to 22 m thick and has been drilled to a depth of 330 m. Drilling has indicated 4.8 million tonnes, grading 52.1% barite, 2.05% Pb and 5.61% Zn. During 1981, I.P. and gravity surveys were conducted on JEAN 1 and 4. This work reaffirmed results of a 1977 survey, which showed a combined weak I.P. and gravity anomaly south of the known deposit.

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McMILLAN
Noranda Exploration
Company Limited (N.P.L.);
ASARCO

Lead, Zinc, Silver
Stratabound
95 D 5, 12 (3)
(60°30'N,127°56'W)

References: Sinclair et al (1975, p. 153-154); Sinclair et al (1976, p. 154-155); Morin et al (1977, p. 188); Morin et al (1979, p. 75); Morin, 1981 in D.I.A.N.D. (1981, p. 105-109).

Claims: SOUTH NAHANNI, DOROTHY, SN, M, QTZ, STRAT, WH1 3 Fr, PIC 1-3 Fr (total of 133 claims, fractions and 21-year leases).

Source: Summary by P. Watson from assessment report 090703 and 090710 by G. MacDonald and assessment report 090954 by R. Rogers.

Current Work and Results:

In April and May, 1980, 8 BQ diamond drill holes were completed to 845.3 m total depth. Three were drilled to test stratigraphy and geophysical targets north of the "main zone" mineralization and intersected interbanded quartzites and argillites with some disseminated, and occasional massive, pyrite. Five drill holes collared further east encountered limestones, argillites and quartzites with one hole reporting a 9.1 m intersection of galena, sphalerite and pyrite.

In August, 1981, a total of 640.4 m was drilled in 6 holes. These intersected a mixture of argillite, argillaceous limestone, quartzite and limestone, and in several holes, massive pyrite was encountered.

WOLF
B. Asbury — 95 D 7 (9) (60°22'N,126°32'W)

Claims: WOLF 1-8

Source: Summary by P. Watson from assessment report 090905 by B. Asbury.

Current Work and Results:

A preliminary stream sediment and soil geochemical survey was conducted in 1980. Approximately 130 samples were collected and analyzed for Pb and Zn.

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LOOTZ
SEREM Limited — 95 D 7 (13) (60°17'N,126°40'W)

Claims: LOOTZ (40)

Current Work and Results:

The claims were mapped at a scale of one inch to 1/2 mile and soil sampled. No other information is available.

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OUDDER
Cub Joint Venture — 95 D 10 (15) (60°36'N,126°42'W)

Claims: OUDDER (22); FAR (16); WAY (16)

Current Work and Results:

The property is underlain by mid-Ordovian Sunblood Formation limestone and Devonian Road River Formation cherts and siltstones that have been intruded by a small Cretaceous (?) granodiorite stock.

The claims were staked by Cub Joint Venture in 1981 to cover the source of moderately anomalous amounts of scheelite in creek panning samples. The same year, a portion of the claims were mapped at a scale of 1:5,000 and covered by a 200 m by 50 m soil sampling grid. A ground proton magnetometer survey was also conducted and an area of approximately 260 km^2 was covered by a regional stream sediment sampling program.

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STAR
Noranda Exploration Company Limited — Geochemical Target, 95 D 11 (17) (60°30'N,127°24'W)

Claims: STAR 1-16

Source: Summary by P. Watson from assessment report 090918 by R. Rogers.

Description:

The STAR 1-8 claims were added in 1981. Reconnaissance work was done in the area in 1977 and 1979. Three units are recognized on the property. In the north, Lower Cambrian sandstone and carbonates are in fault contact with Lower Cambrian limestones. These are overlain in the south by carbonates and siltstones of the Sunblood Formation.

Current Work and Results:

During 1981, 2,800 m of line were cut and a preliminary geological reconnaissance carried out. No mineralization was found, and the 1977 zinc soil anomaly appears to be located in a swamp.

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ROCK RIVER AREA
Sulpetro Minerals Limited — Coal, 95 D (60°40'N,127°10'W)

References: Harrison (1982); Hughes and Long (1980).

Coal Exploration Licence: 118

Description:

The property is approximately 105 km northeast of the Watson Lake airport, with the coal deposits, discovered in July, 1980, located approximately 80 km north of the Alaska Highway and Contact Creek crossing. There is no road access into the property.

The coal accumulation in the Rock River basin is thought to be associated with crustal extension and subsidence during the Eocene. The property is underlain by alternating fine- to medium-grained clastics, coal and organic-rich clastics. The Tertiary stratigraphy may be summarized as follows:

1) greater than 125 m sand and silt (bottom of section);
2) 162 m coal and clay;
3) greater than 44 m silt and organic clay (top of section).

The coal unit is intermixed and interstratified with clay. The coal is dominantly sub-bituminous C (A.S.T.M. classification), and the tonnage is estimated to be approximately 50,000,000 tonnes. Open-pit mining technique would be employed for this deposit, and a potential use is thermal generation of hydroelectric power.

Current Work and Results:

The 1980/81 field season involved helicopter-supported prospecting and topographic mapping at 1:10,000 and 1:50,000 scales for base map control. Additional work during August and September, 1981 included diamond drilling a total of 718 m in five holes complete with geophysical logging and sample analysis on coal retrieved. During February and March, 1982 a gravity survey was completed which involved all the coal exploration licenses held by Sulpetro Limited.

1981 MINERAL CLAIMS STAKED

CUZ 95 D 5 (11)
Archer, Cathro and Associates Limited (60°28'N,127°51'W)

Claims 1981: CUZ (56)

HOSER 95 D 6 (12)
Sulpetro Minerals Limited (60°22'N,127°20'W)

Claims 1981: KELI (8); JONI (8); EDY (7); HOSE (8); JERI (8); OTT (8); RALPHO (7); SIN (8); MUMBO (8); TOMI (8); YANG (6); CHUNGO (8); BOZ (4)

LOOTZ 95 D 7 (13)
Serem Limited (60°17'N,126°48'W)

Claims 1981: LOOTZ (40)

JT 95 D 7 (14)
D. Kronig (60°19'N,126°34'W)

Claims 1981: JT (8)

OUDDER 95 D 10 (15)
Archer, Cathro and Associates Limited (60°37'N,126°41'W)

Claims 1981: FAR (16); OUDDER (22); WAY (16)

DK 95 D 10 (16)
D. Kronig (60°35'N,126°49'W)

Claims 1981: DK (44)

STAR 95 D 11 (17)
Noranda Exploration Company Limited (60°30'N,127°54'W)

Claims 1981: STAR (16)

HERPES 95 D 14 (18)
Archer, Cathro and Associates Limited (60°56'N,127°26'W)

Claims 1981: HERPES (16)

SPORK 95 D 14,95 E 3(10)
Archer, Cathro and Associates Limited (60°00'N,127°14'W)

Claims 1981: SPORK (8)

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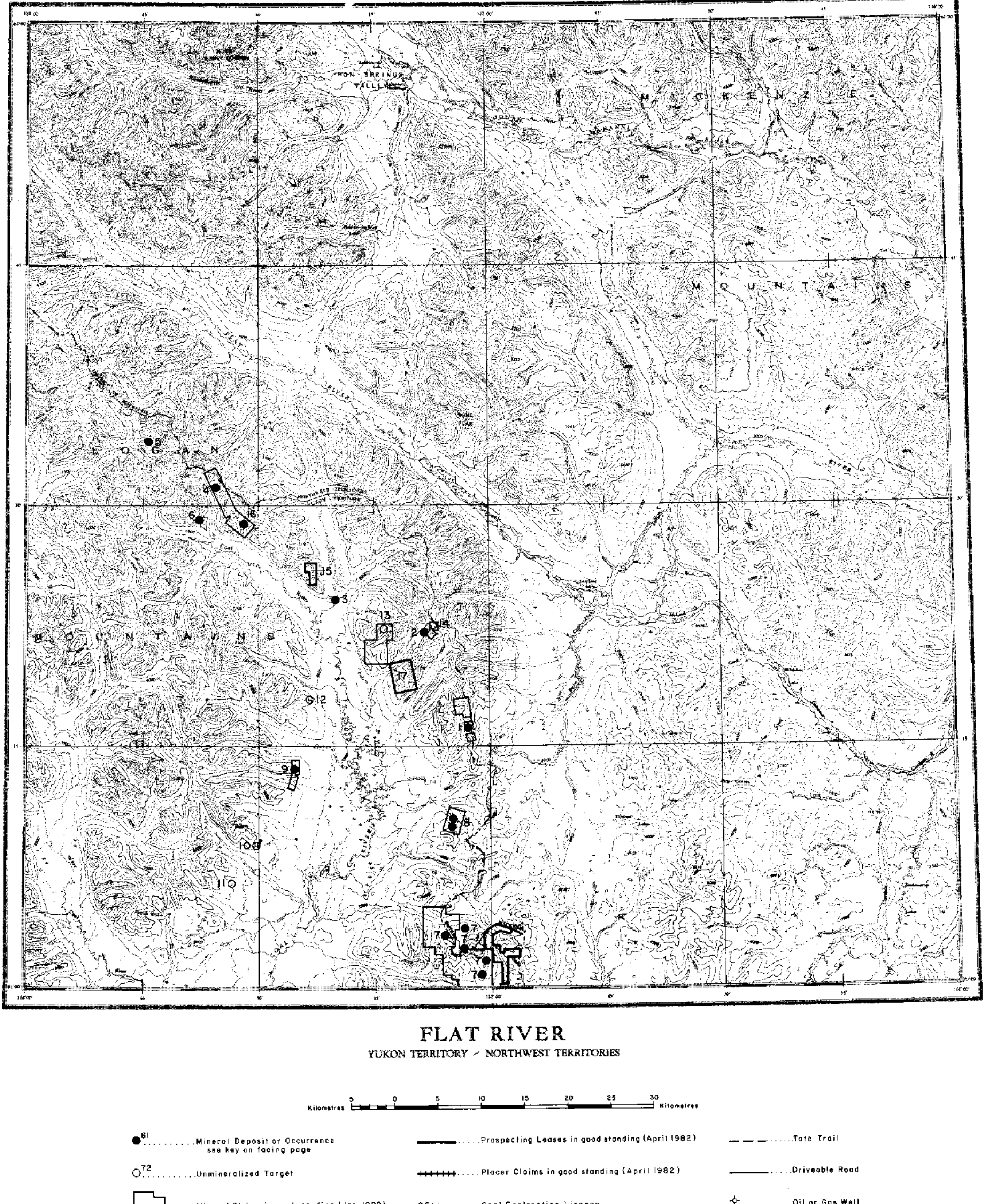
95E



FLAT RIVER

YUKON TERRITORY / NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

FLAT RIVER MAP-AREA (NTS 95 E)

General Reference: GSC Map 1313A and Memoir 366 by: H. Gabrielse, J.A. Roddick, S.L. Blusson.

NO.	PROPERTY NAME	REFERENCE
1	TWIN	Copper-Silver-Lead-Zinc-Gold Vein; Morin et al (1980, p. 50)
2	KOMISH	Skarn Tungsten Occurrence
3	MARION	Gabrielse et al (1965, p. 28); Mulligan (1964, p. 81)
4	HEATHER	Findlay (1969b, p. 51-52)
5	CAESAR	Skarn Tungsten Occurrence
6	CHARLIE	D.I.A.N.D. (1981, p. 135)
7	IVO	This Report
8	SNEET	D.I.A.N.D. (1981, p. 136)
9	FYIQ	D.I.A.N.D. (1981, p. 136-137)
10	JOSE	D.I.A.N.D. (1981, p. 137)
11	NOWA	D.I.A.N.D. (1981, p. 137)
12	HOGIE	D.I.A.N.D. (1981, p. 137)
13	CREAM	This Report
14	LABELLE	D.I.A.N.D. (1981, p. 137)
15	ROSE	This Report
16	RIO	This Report
17	VNER	This Report

IVO
Cub Joint Venture

Tungsten Skarn
95 E 3 (7)
(61°03'N,127°03'W)

Reference: D.I.A.N.D. (1981, p. 135-136).

Claims: IVO (274)

Current Work and Results:

Scheelite and molybdoscheelite occur in skarns developed in carbonates at the base of Lower Cambrian Sekwi Formation and in carbonates within the Lower Cambrian Backbone Ranges clastics, adjacent to Tertiary -Cretaceous granites.

Parts of the claim block were covered by 100 m by 50 m, or 200 m by 100 m soil survey grids in 1981, and samples were analyzed for W, Mo, Pb and Zn. Some sections were also covered by ground proton magnetometer and EM-16 surveys. Twelve BQ diamond drill holes were completed to a total depth of 1,222 m, to test the W (Mo) mineralization around the SALIVO stock.

Ten small W(Cu) showings have been located in dark skarn around the larger of two stocks (IVO), in the northwestern part of the property. An extensive skarn zone was traced by geophysics and drilling for over three km along the contact with the small (SALIVO) stock, in the southeast part of the property.

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CREAM
Cub Joint Venture

Tungsten Skarn
95 E 6 (13)
(61°23'N,127°13'W)

Reference: D.I.A.N.D. (1981, p. 51-54)

Claims: CREAM 1-8

Source: Summary by P. Watson from assessment report 090860 by R.J. Cathro.

History:

The CREAM 1-8 claims were staked in 1980 by Cub Joint Venture (Cassiar Asbestos Corporation Limited, Highland - Crow Resources Limited and Union Carbide Canada Limited, managed by Archer, Cathro and Associates Limited) to cover tungsten skarns at the contact between Lower Cambrian limestone and a Cretaceous to early Tertiary pluton. An additional 44 claims were added in June, 1981.

Current Work and Results:

No mineralization was found in outcrop on the CREAM 1-8 claims in 1980, although skarn samples grading up to 3.7% WO_3 were found in talus south of the claim group.

In 1981, geological mapping, grid geochemical sampling, ground magnetic and EM-16 surveys were conducted. Silt and soil panning samples were taken from non-organic clay or sandy material. Panned samples contained up to 300 grains of scheelite per pan of soil and 10 grains of scheelite per pan of silt. A fresh sample from each location was also collected and analyzed for W, and in some cases Pb, Zn or Mo. Values up to 35 ppm W in soil and 5 ppm W in silt were obtained. Pb, Zn and Mo values were not anomalous.

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ROSE	Tungsten Skarn
Noranda Exploration Company Limited	95 E 6 (15)
	(61°26'N,127°23'W)

References: D.I.A.N.D. (1981, p. 137); Morin et al (1980, p. 51).

Claims: ROSE 10, 12, 14, 16, 18, 29-33, 35, 37

Source: Summary by P. Watson from assessment report 090911 by R. Rogers.

Current Work and Results:

The 1981 program consisted of geological, geochemical and magnetometer surveys and trenching. Seventy-four samples were analyzed for Cu, Zn, Pb, Ag, Mo, Mn, F and W. Cu, Zn and Pb values defined a broad, horseshoe-shaped anomaly open to the north. Two linear anomalies were outlined by the magnetometer survey and reflect prior geochemical anomalies. Three trenches were excavated on geochemical and magnetic anomalies. One 10 m channel sample assayed 0.11% WO_3, 5.5 g Ag/t, 0.2% Pb, 0.52% Zn, 0.01% Cu and 0.001% Au.

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RIO	Silver, Lead, Zinc
Ramrod Mining Corporation	95 E 5 (16)
	(61°29'N,127°33'W)

Claims: RIO 1-24

Source: Summary by P. Watson from assessment report 090831 by D.W. Tully.

History:

The entire claim block consists of 128 claims and claim units, straddling the Yukon - Northwest Territories border. The ROD, SUD and RIO claims (totalling 72 claims) are located in the Yukon, while the RAM, NORD and EAST groups are located in N.W.T. Mineralization was first discovered in the area in 1965, and various work, including drilling, carried out up to the early seventies on showings on the ROD and SUD claims in Yukon (HEATHER #4). In 1979 and 1980, Ramrod Mining Corporation optioned the property and drilled on the N.W.T. claims. In 1981, drilling was carried out on the East Creek Zone on the RIO claims.

Description:

Four major units have been identified in this area: Sekwi Formation mid-Cambrian(?) calcareous sedimentary rocks; Rabbitkettle Formation late Cambrian(?) limestones and siltstones; Road River Formation mid-Paleozoic black shales and limestone; and Cretaceous quartz monzonite to granodiorite of the Turner Batholith. Extensive hornfels and skarn have been developed, with pyrite, sphalerite, galena and pyrrhotite present.

Current Work and Results:

In 1981, seven BQ diamond drill holes were completed to a total depth of 1,078.9 m. Three of these intersected some mineralization with the following results reported: 0.52% Pb, 3.66% Zn, 0.04% WO_3 and 16.5 g Ag/t over 1.3 m; 2.22% Pb, 0.09% Zn, 0.02% WO_3 and 3.4 g Ag/t over 1.5 m and 1.06% Pb, 1.26% Zn, 0.01% WO_3 and 13.0 g Ag/t over 1.8 m.

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1981 MINERAL CLAIMS STAKED

IVO	95 E 3 (7)
Archer, Cathro and Associates Limited	(61°03'N,127°05'W)

Claims 1981: IVO (55)

CREAM	95 E 6 (13)
Archer, Cathro and Associates Limited	(61°22'N,127°13'W)

Claims 1981: CREAM (44)

VNER	95 E 6 (17)
Archer, Cathro and Associates Limited	(61°19'N,127°11'W)

Claims 1981: VNER (40)

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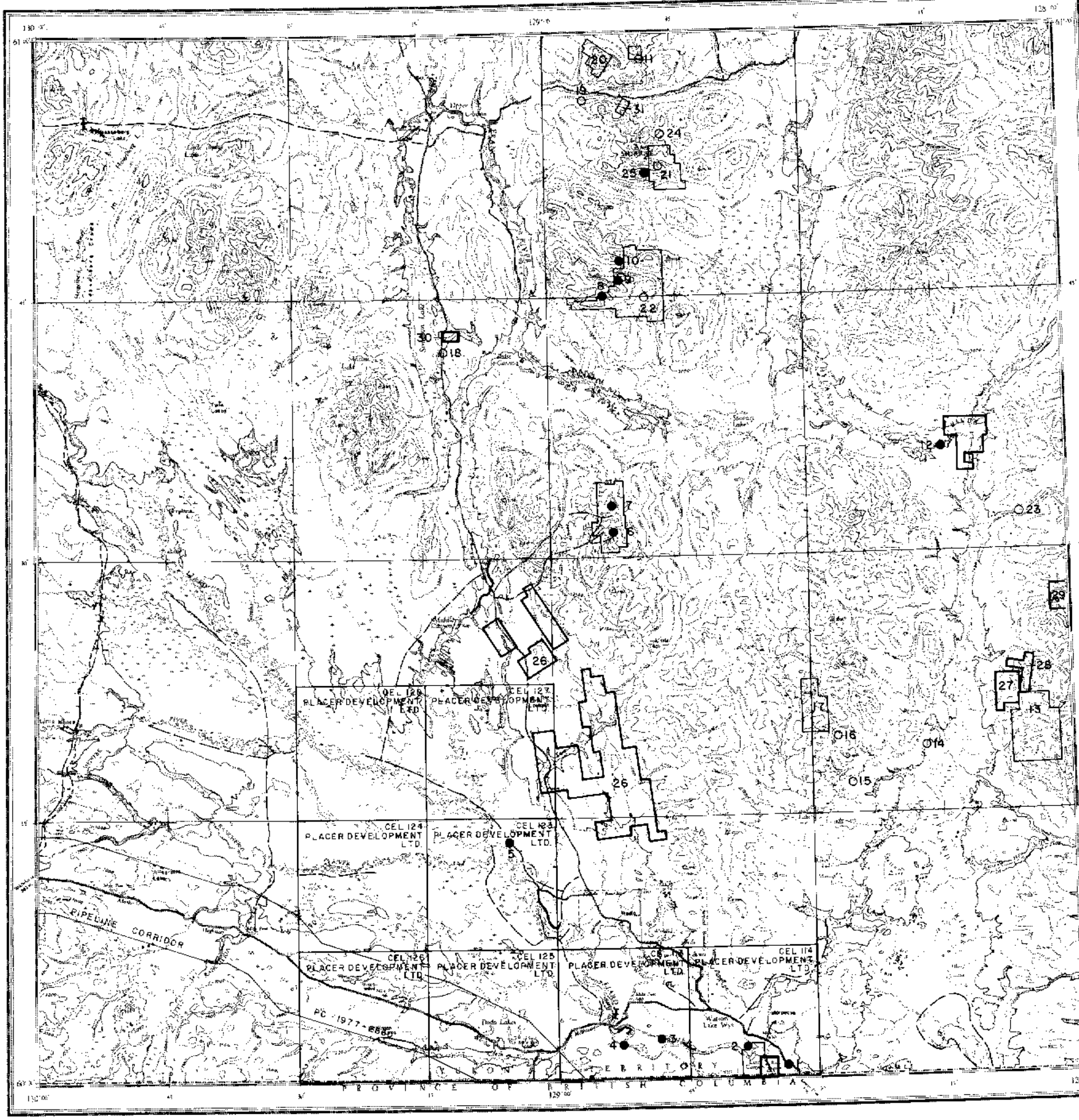
105 A



WATSON LAKE

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 .... Mineral Deposit or Occurrence see key on facing page

○ 72 .... Unmineralized Target

...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

...... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL........ Coal Exploration Licence

CML........ Coal Mining Lease

..... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

WATSON LAKE MAP-AREA (NTS 105 A)

General Reference: GSC Map 19-1966 by: H. Gabrielse, 1966.

NO.	PROPERTY NAME	REFERENCE
1	WATSON	Dawson (1889, p. 99)
2	NAZO	Dawson (1889, p. 99);This Report*
3	CAROL	Lord (1944, p. 19)
4	ALBERT	Lord (1944, p. 19)
5	SAWMILL	Lord (1944, p. 19)
6	HUNDERE	This Report
7	RITCO	Findlay (1967, p. 65-66)
8	OSCAR	Skarn Tungsten-Copper-Molybdenum
9	PAT	D.I.A.N.D. (1981, p. 140)
10	MARTIN	Skarn Tungsten-Copper
11	NOTT	This Report
12	WARBURTON	Silver-Lead-Zinc-Copper Vein; This Report
13	HYLAND	This Report
14	TILL	D.I.A.N.D. (1981, p. 141)
15	LING	D.I.A.N.D. (1981, p. 141)
16	TOMMY	D.I.A.N.D. (1981, p. 141)
17	CELESTIAL	This Report
18	FALSE	D.I.A.N.D. (1981, p. 141)
19	KLUNK	D.I.A.N.D. (1981, p. 141)
20	BLACK	This Report
21	MURRAY	D.I.A.N.D. (1981, p. 140)
22	PEGASEUS	D.I.A.N.D. (1981, p. 141)
23	GUM BEE	Morin et al (1980, p.51)
24	EMILY	Morin et al (1980, p.52)
25	MARK	Morin et al (1980, P.52)
26	GE	This Report
27	CJ	This Report
28	MJM	This Report
29	AUP	This Report
30	CASHBOX	This Report
31	MOLLY	This Report

* see page 98

HUNDERE
Cima Resources Limited

Lead, Zinc, Silver
Skarn
105 A 10 (6)
(60°31'N,128°53'W)

References: D.I.A.N.D. (1981, p. 140); Abbott (1981, in D.I.A.N.D. 1981, p. 45-50).

Claims: MICA 1-12, 40-41; CIMA 13-39, 42-102 (104 claims)

Source: Summary by P. Watson from assessment report 090955 by I.R. Corvalan.

History:

The property was first staked in 1962 and trenching, mapping, geochemical sampling and diamond drilling carried out by various companies until 1966. In 1979, Cima Resources Limited staked the CIMA and MICA claims and mapped, trenched, soil sampled and drilled 44 diamond drill holes in 1979-1980. These programs blocked out the following proven reserves.

Year	Location	Tonnes	%Pb	%Zn	g Ag/t
1979	Main Zone	66,442	15.6	18.9	80.91
1980	Main Zone (extension)	59,486	12.6	13.8	81.26
1980	East Zone	122,462	6.38	7.10	107.66

Description:

The claims are underlain by a northwest-trending, Lower Cambrian and older, sedimentary sequence of phyllite, slate and limestone intruded by minor diorite sills and micro-porphyritic dykes. Significant Pb-Zn-Ag mineralization occurs in skarn units developed in limestone adjacent to a phyllite contact and in phyllite. Sulphide mineralization occurs as galena ± sphalerite in quartz and calcite veins, in skarns and disseminated in the sedimentary rocks. The South Showing mineralization is structurally controlled by a series of northwest striking faults, and the sediments have been folded into a broad "S" shape. The North Showing is associated with a flat-plunging synclinal nose, or a series of drag folds.

Current Work and Results:

A program of linecutting, geochemical sampling, geological mapping, bulldozer trenching and diamond drilling was undertaken in 1981. Nineteen BQ and NQ diamond drill holes were completed for a total of 797 m. Fourteen of these were drilled on the East Zone - South Showing, and reserves for the East Zone were revised to 137,244 tonnes grading 6.44% Pb, 6.31% Zn and 181.4 g Ag/t.

A total of 137 soil samples were collected and thresholds determined were as follows: 75 ppm Pb, 150 ppb Zn and 1.0 ppm Ag. One significant anomaly was noted.

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NOTT
Alex Black

Copper, Lead, Tungsten
105 A 15 (11)
(60°59'N,128°49'W)

Claims: QUEEN 1-4, 17-20, 37

Source: Summary by P. Watson from assessment report 090885 by T. Liverton.

History:

The initial 40 claims were staked in 1980 to cover Cu, Pb, W mineralization within a granodiorite pluton. Nine claims of that block were retained. Excavation of a pit on the showing was carried out in 1980.

Current Work and Results:

During 1981, the pit was expanded, and 33 soil samples were collected on a small grid centered on the pit. Three joint sets were evident, with the following strikes and dips: 085°, 69°S; 010°, 52°E and 010°, 55°W. The northerly-trending sets carry epidote and galena to 5 mm widths. Geochemical results indicate that mineralization may be associated with the north-trending joint sets, although chalcopyrite, galena and scheelite occur at the intersection of the three joint sets, in the showing.

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HYLAND — Geochemical Target
Cyprus Anvil Mining Corporation Limited — 105 A 8 (13) (60°18'N,128°05'W)

Claims: GS 1-96; SF 1-28; HY (36)

Source: Summary by P. Watson from assessment report 090893 by D.A. Perkins and J.W. Mustard.

History:

The HY (180) claims were staked in 1978 by Cordilleran Engineering following a regional stream sediment sampling program. In 1979, geological and soil geochemical surveys were conducted and the core of the claim group retained. Cyprus Anvil Mining Corporation staked the GS and SF claims in 1980 to cover a coincident Cu, Pb, Zn anomaly resulting from a regional geochemistry program. The HY claims were then optioned by Cyprus Anvil Mining Corporation.

Description:

The area is underlain by a northwest-trending belt of Devonian to Mississippian sedimentary rocks, consisting mainly of non-calcareous chert, siliceous shale, shales and chert conglomerates. This package is fault-bounded on both sides, exposing Hadrynian and Lower Cambrian grits to the east, and Triassic shales and sandstones to the west. Cretaceous quartz feldspar porphyry dykes intrude the area.

Current Work and Results:

In 1981, 111 km of grid lines were cut and sampled. A total of 2,365 soil samples were collected and analyzed for Cu, Pb and Zn. Samples containing values greater than 102 ppm Pb, 400 ppm Zn or 38 ppm Cu (mean plus two standard deviations) were considered anomalous.

******

CELESTIAL
Cyprus Anvil Mining Corporation Limited — 105 A 7, 8 (17) (60°21'N,128°31'W)

Claims: SUN (9); MOON (55)

Source: Summary by P. Watson from assessment report 090900 by D.A. Perkins and J.W. Mustard.

History:

The SUN 1-24 claims were staked in 1978 to cover an anomalous stream sediment sample and the 9 core claims retained. In 1980, Cyprus Anvil Mining Corporation staked the MOON claims, following a regional stream sediment sampling program and later optioned the SUN claims.

Description:

These claims are situated within a northerly trending belt of Hadrynian and Lower Cambrian sedimentary rocks. An Upper Cretaceous quartz feldspar porphyry stock is exposed at the center of the SUN group. The northern half of the property is dominated by white weathering marble and grey limestone, while the southern half is dominated by non-calcareous phyllite.

Current Work and Results:

During 1981, 1,199 soil samples were collected and analyzed for Cu, Pb and Zn. Lead proved to be the most responsive element and two anomalous areas were delineated. One of these areas also contained anomalous zinc values. Only random spot highs of copper were reported. The mean plus two standard deviations for each element were as follows: 84 ppm Pb, 210 ppm Zn and 51 ppm Cu.

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BLACK — Geochemical Target
A. Black; Cyprus Anvil Mining Corporation Limited — 105 A 15 (20) (60°58'N,128°54'W)

Claims: KING 1-30

Source: Summary by P. Watson from assessment report 090682 by G.A. Jilson and assessment report 090862 by T. Liverton.

History:

KING 1-8 were staked in 1979, presumably to cover a magnetite-bearing skarn. The showing is reported to have been previously staked as the RICHARD claims in 1970. KING 9-30 were staked in 1980. The southern corner of the claim group is approximately 1 km north of the Nahanni Range Road. The claims were optioned by Cyprus Anvil Mining Corporation in 1980.

Description:

The area is underlain by a regionally metamorphosed sequence of lower Paleozoic pelitic schists and calc-silicates, intruded by a mid-Cretaceous granodiorite batholith.

Current Work and Results:

During a 1980 geochemical survey, approximately 400 soil samples were collected and analyzed for Cu, Pb, Zn, W, Sn and Mo. No significant anomalies were found, although several small, scattered, very weak copper-lead-zinc anomalies occur as a belt through the central portion of the grid, and a small intense tungsten anomaly was also found. The belt of copper-lead-zinc anomalous values approximately parallels the intrusive metasedimentary rock contact and is underlain by calc-silicates with some included pelitic rocks, which may contain small pods of Cu ± Pb ± Zn ± W replacement mineralization as the source of the anomalies.

Traces of pyrite are associated with minor chlorite along fractures in the granodiorite and small amounts of pyrrhotite with trace chalcopyrite occur in the calc-silicates. Up to several percent pyrite and pyrrhotite with lesser magnetite occur in siliceous phyllite lenses in the calc-silicates. The massive magnetite reported previously was not found.

During 1981, T. Liverton (Tarmachan Exploration Services Ltd.) and A. Black carried out a detailed soil geochemistry survey in the vicinity of the 1980 tungsten soil anomaly and prospected the northern part of the claims. Pits up to 0.5 m deep were dug at 10 m intervals along the 1980 sample line around the tungsten anomaly and 0.5 kg soil samples panned for heavy mineral concentrates. These were UV lamped, and a barely anomalous maximum scheelite grain count of 20 grains per pan was obtained. The source of this anomaly is believed to be a granitic dyke underlying the area, containing trace scheelite in its contact aureole. No significant mineralization was reported.

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MOLLY
A. Black;
Tarmachan Exploration
Services Limited

Molybdenum
105 A 15 (31)
(60°56'N,128°49'W)

Claims: MOLLY 1-16

Source: Summary by P. Watson from assessment report 090873 by T. Liverton.

Description:

The claims were staked in 1979 to cover disseminated molybdenite mineralization in quartz veins in a granitic intrusion. The quartz veins, up to 15 cm wide, contain blebs or pods of massive pyrite (up to 15 cm) and disseminated molybdenite flakes, and occur in a set of north-northeast trending joints within the Cretaceous biotite-hornblende granodiorite.

Current Work and Results:

Mapping and prospecting were carried out over a small portion of the property. Several alteration zones and joint sets were noted.

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1981 MINERAL CLAIMS STAKED

NAZO
C. Pete et al
105 A 2 (2)
(60°01'N,128°37'W)

Claims 1981: ROMAN 31-45

GE
Shell Canada Resources
105 A 2,6,7 (26)
(60°13' - 60°28'N,
128°47' - 129°08'W)

Claims 1981: GE (600)

CJ
J. Taylor et al
105 A 8 (27)
(60°22'N,128°07'W)

Claims 1981: CJ (44)

MJM
Noranda Exploration
Company Limited
105 A 8 (28)
(60°23'N,128°05'W)

Claims 1981: MJM (20); JAY (8)

AUP
Archer, Cathro and
Associates Limited
105 A 8 (29)
(60°27'N,128°01'W)

Claims 1981: AUP (24)

WARBURTON
Warburton Minerals Incorporated
105 A 9 (12)
(60°35'N,128°14'W)

Claims 1981: RIVER (76)

CASH BOX
D. Jones
105 A 11 (30)
(60°42'N,129°11'W)

Claims 1981: CASH BOX (8)

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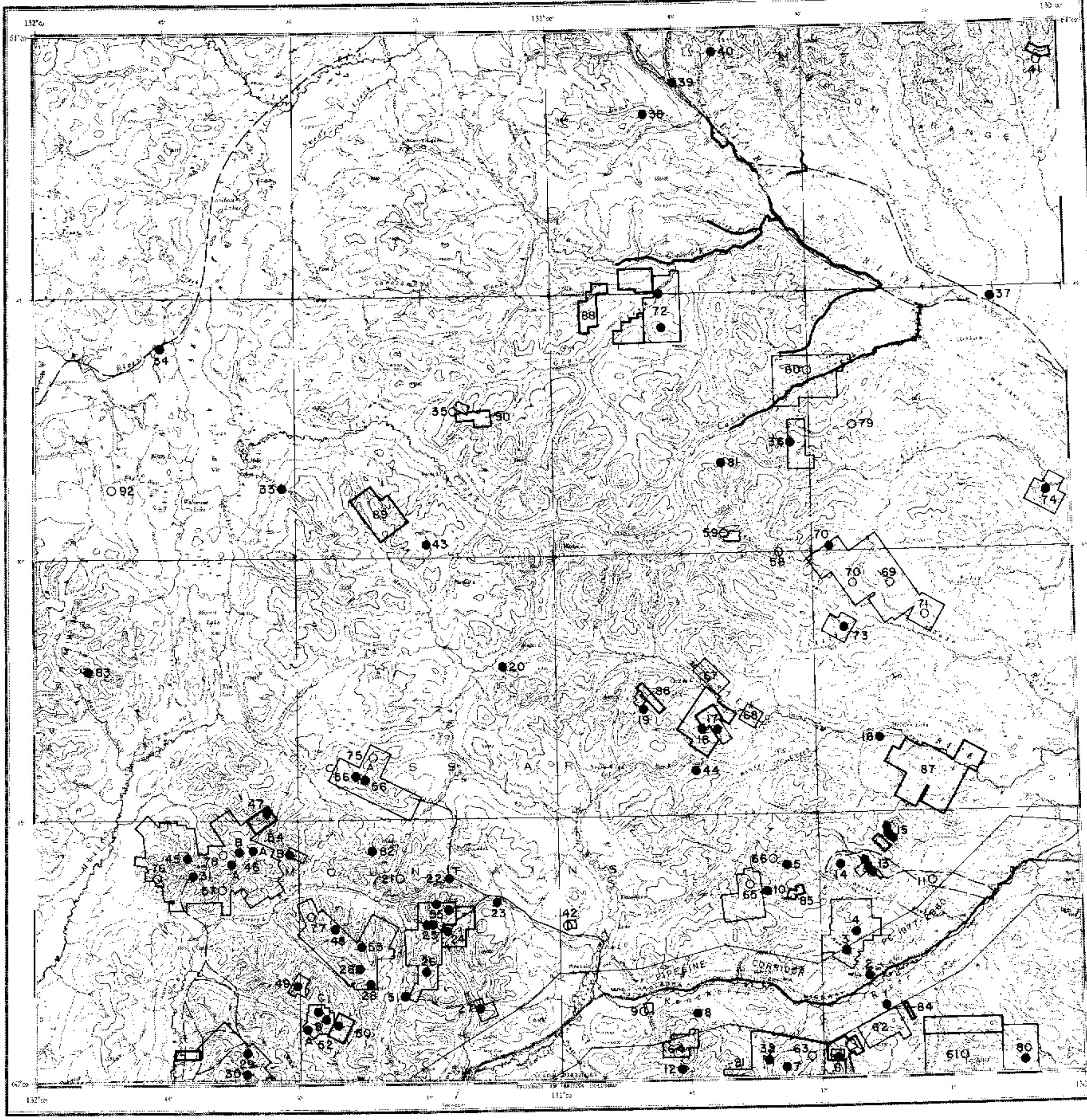
105 B



WOLF LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- ○72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ...... Mineral Claims staked in 1981
- ..... Prospecting Leases in good standing (April 1982)
- ..... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- ...... Tote Trail
- ...... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

WOLF LAKE MAP-AREA (NTS 105 B)

General Reference: GSC Map 10-1960 by: W.H. Poole, J.A. Roddick and L.H. Green.

NO.	PROPERTY NAME	REFERENCE
1	LORD	Lord (1944, p. 17)
2	STERLING	Silver-Lead-Zinc-Copper-Gold Vein
3	LUCK	D.I.A.N.D. (1981, p. 144)
4	FIDDLER	D.I.A.N.D. (1981, p. 144)
5	LENA	Silver-Lead Vein
6	DALE	Green (1966, p. 79); This Report
7	HOLLIDAY	Silver-Lead-Zinc-Tin Vein
8	TROY	Copper Occurrence
9	CARLICK	
10	SHILSKY	Skarn Copper
11	KUBIAK	Lead-Zinc Vein
12	BLACK ROCK	Silver-Lead-Zinc-Copper Vein
13	KODIAK	Green (1965, p. 44)
14	HARDTACK	Green (1965, p. 44)
15	KERNS	Silver-Lead-Zinc-Copper-Tungsten Vein; This Report
16	MEISTER	Copper Vein
17	NITE	Skarn Tunsten-Molybdenum-Zinc
18	MID	D.I.A.N.D. (1981, p. 159); This Report
19	AURORA	D.I.A.N.D. (1981, p. 159)
20	ALMOST	Tungsten Occurrence
21	HIDDEN	Skarn Lead-Zinc-Copper-Tungsten
22	ATOM	D.I.A.N.D. (1981, p. 144)
23	BAR	D.I.A.N.D. (1981, p. 144)
24	BOM	This Report
25	MUNSON	D.I.A.N.D. (1981, p. 145)
26	PARTRIDGE	D.I.A.N.D. (1981, p. 147)
27	GEM	D.I.A.N.D. (1981, p. 147)
28	VAL B	D.I.A.N.D. (1981, p. 147)
29	LOGJAM	D.I.A.N.D. (1981, p. 147)
30	LOGTUNG (BERYL)	This Report
31	J.C. (VIOLA)	This Report
32	PUG	Silver-Lead Vein
33	TROUT	Iron Vein
34	MUNG	Copper Porphyry
35	IRVINE	D.I.A.N.D. (1981, p. 149)
36	TUNG	D.I.A.N.D. (1981, p. 149)
37	MOOSELICK	Craig and Laporte (1972, Vol. 1, p. 138-139)
38	DOME	Green (1966, p. 84)
39	OLD GOLD	Findlay (1967, p. 64)
40	RAINBOW	Copper Vein
41	PORCUPINE	Asbestos; This Report
42	OULETTE	D.I.A.N.D., Mines and Minerals Activities, 1971, p. 73
43	ZAC	Sinclair & Gilbert (1975, p. 80)
44	BOY	D.I.A.N.D. (1981, p. 150)
45	M.C.	This Report
46	DU	This Report
47	I	This Report
48	SIN	D.I.A.N.D. (1981, p. 152); This Report
49	VH	D.I.A.N.D. (1981, p. 152)
50	SLOUCE	This Report
51	SKIN	D.I.A.N.D. (1981, p. 152)
52	MW	This Report
53	MUN	This Report
54	CAN	This Report
55	STQ	D.I.A.N.D. (1981, p. 145)
56	HL	This Report
57	FUR	D.I.A.N.D. (1981, p. 155)
58	COM (54-59)	D.I.A.N.D. (1981, p. 155)
59	COM (45-53)	D.I.A.N.D. (1981, p. 155)
60	CABIN	This Report
61	MIDWAY (TOOT)	This Report
62	IDAHO	D.I.A.N.D. (1981, p. 159)
63	ANT	D.I.A.N.D. (1981, p. 159)
64	LICK	This Report
65	GOAT	This Report
66	BESSEY	D.I.A.N.D. (1981, p. 159)
67	CARIBOU	D.I.A.N.D. (1981, p. 156)
68	OAKE	D.I.A.N.D. (1981, p. 156)
69	URSUS	This Report
70	LOGAN	D.I.A.N.D. (1981, p. 156)
71	MOOSE	D.I.A.N.D. (1981, p. 156)
72	TEAM	This Report
73	LITTLE MOOSE	D.I.A.N.D. (1981, p. 157)
74	WOLF	This Report
75	ICE	This Report
76	PLUG	D.I.A.N.D. (1981, p. 158)
77	PONT	D.I.A.N.D. (1981, p. 158)
78	ZINC	D.I.A.N.D. (1981, p. 158)
79	ELLE	D.I.A.N.D. (1981, p. 158)
80	HOT	D.I.A.N.D. (1981, p. 159)
81	BINGY	Sinclair et al (1976, p. 159-160)
82	GULL	Morin et al (1980, p. 56)
83	ANNI	Morin et al (1980, p. 59)
84	MAC	This Report
85	LOST	This Report
86	PINESOL	This Report
87	MR	This Report
88	STONEAXE	This Report
89	THRALL	This Report
90	SOURCE	This Report
91	BORDER	This Report
92	CO	This Report

NAZO
Alex Black

Barite
105 A 2 (2)
(60°01'N,128°37'W)

Claims: BROD 1-2

Source: Summary by P. Watson from assessment report 090882 by T. Liverton.

Current Work and Results:

The claims are underlain by Cambrian to Ordovician(?) black slate cut by two pyritic dacite dykes. Pyrite-rich bands occur up to 10 cm thick and several barite veins, from 10 cm to 2 m in width, occur commonly along the cleavage. The thick veins are generally less than 3 m strike length and contain quartz and some country rock, as well as barite. The thinner veins contain just barite and can be traced for 10 m or more.

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BOM
J.C. Stephen
Explorations Ltd.;
D.C. Syndicate

Zinc, Lead, Silver
Skarn
105 B 3 (24)
(60°09'N,131°11'W)

References: Gower (1952, p. 28-30); Green (1966, p. 76-79); Craig and Laporte (1972, p. 137); Craig and Milner (1975, p. 108-109); Mulligan (1975, p. 80); D.I.A.N.D. (1981, p. 145).

Claims: ROAD (44 claims)

Source: Summary by P. Watson from assessment report 090798 and 090921 by J.C. Stephen.

History:

This property was first explored in the late 1940's, and has been reported on previously as BOM and MOD. This report refers to the ROAD claims, which are staked around the MOD 1-4 claims, and adjacent to the STQ claims.

Current Work and Results:

In 1980, a small stream sediment, talus and rock geochemical sampling program was carried out for Cu, Zn, Mo, Sn and W content. Anomalous values for Zn, Sn, W and Mo were reported but no source was determined.

In 1981, an additional 24 rock and 26 talus samples were collected, as part of a geological mapping program.

A horizon consisting of limestone, calc-silicate, magnetite and sulphide-bearing skarn is believed to occupy a transitional zone between argillaceous and quartzitic rocks on the ROAD and MOD claims. This was mapped as a semi-continuous unit for at least 2,590 m and may be the same horizon that hosts sphalerite and arsenopyrite-bearing skarn, about 1,500 m to the west on the STQ claims.

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LOGTUNG (BERYL)
Logtung Resources;
Amax of Canada Limited

Tungsten, Molybdenum
Porphyry
105 B 4 (30)
(60° 00'N,131° 36'W)

References: Morin et al (1979, p. 78); Morin et al (1980, p. 56-57); D.I.A.N.D. (1981, p. 26, 148).

Claims: LOG 1-138

Source: Summary by P. Watson from assessment report 090661 by F. Harris, S. Noble and S. Parry.

Current Work and Results:

Results of three 1980 NQ drill holes, totalling 813.2 m, were reported. Assays were reported for only two of the holes, although scheelite, powellite and molybdenite were reported in quartz veinlets in all holes. Results included: 0.16% WO_3 and 0.173% MoS_2 over 12 m; and 0.22 WO_3 and 0.0025% MoS_2 over 16 m.

In 1981 Amax conducted environmental baseline data collection, preliminary mine and mill design studies, infrastructure and housing studies, power alternative studies, tailing, plant site and road access investigations and further metallurgical work.

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J.C. (VIOLA)
Cominco Limited

Tin Skarn
105 B 4 (31)
(60°12'N,131°44'W)

References: D.I.A.N.D. (1981, p. 148), Morin et al (1980, p. 57).

Claims: J.C. 1-82

Source: Summary by P. Watson from assessment report 090988 by L.J. Nagy.

Current Work and Results:

One vertical BQ diamond drill hole was completed in July, 1981 to a depth of 145.4 m to test a coincident Sn soil anomaly and weak magnetic anomaly. The hole intersected 84.1 m of quartzite which contained sections with up to 25% magnetic pyrrhotite. From 89.6 m to the end of the hole, diopside skarn and calc-silicates were encountered. These were geochemically anomalous in Sn (0.01 to 0.03% Sn) but contained no economic tin concentrations.

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M.C.
Du Pont of Canada
Exploration Limited

Tin Vein,
Zinc Skarn
105 B 4 (45)
(60°12'N,131°45'W)

References: D.I.A.N.D. (1981, p. 150, p. 32-44); Morin et al (1980, p. 57).

Claims: M.C. 3, 12

Source: Summary by P. Watson from assessment report 090971.

Current Work and Results:

Drill logs for 2 NQ diamond drill holes, drilled in 1981, were reported. The holes totalled 416.79 m and intersected argillite, quartzite, hornfels and skarn. Assays of 950 ppm Sn over 1.1 m in one hole, and 2,000 ppm Sn, and 1,250 ppm Sn over 1 m sections in the second hole, were reported.

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<u>DU</u>
Du Pont of Canada Exploration Limited
Tin Vein
105 B 4 (46)
(60°12'N,131°35'W)

References: D.I.A.N.D. (1981, p. 151); Morin <u>et al</u> (1980, p. 58).

Claims: DU 36, 106, 136

Source: Summary by P. Watson from assessment report 090971.

Current Work and Results:

Drill logs for three NQ diamond drill holes were reported. Four holes were completed in 1981 to a total of 760.2 m. Within these holes arsenopyrite, galena, pyrite, magnetite, cassiterite, fluorite and tourmaline were reported.

One metre sections from two of the holes assayed up to 1,400 ppm and 1,500 ppm Sn respectively. The third hole included 1 m assays of 2,000 ppm and 4,000 ppm Sn.

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<u>I</u>
McPres Explorations Limited;
Player Petroleum Incorporated
Copper, Tungsten, Molybdenum
105 B 5 (47)
(60°15'N,131°33'W)

Reference: D.I.A.N.D. (1981, p. 151)

Claims: TB 1-24

Source: Summary by P. Watson from assessment report 090896 by V. Ryback-Hardy.

History:

The I claims were staked in 1979 by Du Pont of Canada Exploration Limited, examined and then allowed to lapse. The property was restaked as TB by McPres Explorations Limited in 1981 and optioned to Player Petroleum Incorporated.

Current Work and Results:

A preliminary geological investigation was conducted by Player Petroleum Incorporated in 1981.

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<u>SLOUCE</u>
McPres Explorations Limited;
Player Petroleum Incorporated
Skarn
105 B 3 (50)
(60°03'N,131°25'W)

Reference: D.I.A.N.D. (1981, p. 152)

Claims: BT 1-24

Source: Summary by P. Watson from assessment report 090897 by V. Ryback-Hardy.

History:

The SLOUCE claims were staked by Du Pont of Canada Exploration Limited in 1978 to cover tin and tungsten geochemical targets, and examined in 1979 and 1980. These were restaked as BT in 1981 by McPres Explorations Limited and optioned to Player Petroleum Incorporated.

Current Work and Results:

Three rock and five stream sediment samples were collected and analyzed during the 1981 program. Mineralization is reported as disseminated pyrite, chalcopyrite, sphalerite and occasional molybdenite in small skarn bands.

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<u>MW</u>
J.C. Stephen Explorations Ltd.;
D.C. Syndicate
Tin, Zinc Skarn
105 B 3 (52)
(60°03'N,131°28'W)

References: D.I.A.N.D. (1981, p. 152); Morin <u>et al</u> (1980, p. 53).

Claims: MW (46)

Current Work and Results:

Tin mineralization occurs in small skarn lenses in the northern part of the property. Zinc mineralization occurs in a relatively large skarn zone in the eastern part of the claim block, and zinc, lead and silver values occur in sedimentary rocks in the southwest portion of the property.

In 1981, approximately 13 km of grid line were established and approximately 300 soil and talus samples were collected and analyzed for Sn, W and Zn. A proton magnetometer survey was conducted on a part of the property, and three trenches totalling 32 m in length were excavated.

Tin-bearing zones proved to be small and isolated, and no tin or tungsten was found in the exposed portion of the main zinc-bearing skarn horizon. No magnetic zones were indicated in the area covered by the survey.

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MUN
J.C. Stephen
Explorations Ltd.;
D.C. Syndicate

Tin, Tungsten
Skarn
105 B 3 (53)
(60°08'N,131°21'W)

References: D.I.A.N.D. (1981, p. 153); Morin et al (1980, p. 55).

Claims: MUN (80)

Current Work and Results:

Tin and tungsten values occur in narrow skarn zones associated with carbonate horizons close to the Seagull Batholith intrusive contact.

During 1981, approximately 400 soil and talus samples were collected along grids over three areas and analyzed for Sn, W and/or As or Zn. A proton magnetometer survey was conducted on the grids, and the west half of the property was covered by an airborne magnetic survey. Five trenches, totalling 62 m in length, were excavated on three of the claims. Several magnetic zones were shown to be caused by thin bands of magnetic volcanic rocks, but no substantial widths of tin-bearing skarn were exposed.

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CAN
J.C. Stephen
Explorations Ltd.

Tin Skarn
105 B 4 (54A)
(60°13'N,131°32'W)

References: D.I.A.N.D. (1981, p. 153-154), Morin et al (1980, p. 58).

Claims: CAN 29-40, 45-56

Source: Summary by P. Watson from assessment report 090992 by J.C. Stephen.

Current Work and Results:

Three BQ diamond drill holes totalling 182.3 m were completed in 1981 for D.C. Syndicate. In addition, a stadia survey of topography, a magnetometer survey and some geological mapping were undertaken and a 4.6 m by 1.8 m trench was excavated.

The first drill hole did not intersect a skarn zone, but 0.15 m of altered granite contained 0.28% Sn and 0.54% Cu. One skarn zone was encountered in the second hole, containing low Sn values. Two skarn bands were intersected in the third hole, and grades of 0.63% Sn over 3.5 m and 0.247% Sn over 5.8 m were reported.

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HL
Westmin Resources Limited;
Swift River Resources

Tungsten
105 B 6 (56)
(60°17'N,131°20'W)

References: D.I.A.N.D. (1981, p. 154-155); Morin et al (1980, p. 59).

Claims: HL 1-126

Source: Summary by P. Watson from assessment report 090836 by A.W. Randall.

History:

The HL claims were staked in 1978 and 1979 by Cordilleran Engineering and optioned by Western Mines Limited (now Westmin Resources Limited) in 1980. The claim block is located approximately 25 km north of Swift River.

Current Work and Results:

During 1980, Westmin Resources Limited carried out geological mapping, prospecting, cat trenching and geochemical sampling on the property.

The area is underlain by a folded sequence of grits, phyllites and schists of possible Proterozoic age. Included are massive actinolite-plagioclase bands up to 50 cm thick, and discontinuous bands of calc-silicates and chert up to 1 m thick (although generally 1-10 cm thick). The calc-silicate bands host the scheelite mineralization and are most abundant in the grits, while the chert bands may contain up to 5% pyrrhotite and are less common.

Scheelite occurs as stratabound, or fracture-controlled, mineralization. The fracture-controlled mineralization occurs in fractures crosscutting the calc-silicate and cherts, and rarely extends far from the stratabound mineralization.

Approximately 1,550 m of trenching was completed in 18 trenches. Although grab sample assays up to 2.5% WO_3 were previously reported, only minor mineralization was found in the trenches, and the best reported assay was 0.58% WO_3 over 0.8 m.

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CABIN
SEREM Limited

105 B 9,10 (60)
(60°40'N,130°30'W)

Reference: D.I.A.N.D. (1981, p. 155).

Claims: CABIN 1-170

Source: Summary by P. Watson from assessment report 091010 by M.A. Stammers.

Current Work and Results:

During 1981 chip sampling programs were carried out on CABIN 1-10, 71-80, 103-108 and 129-134. A proton magnetometer survey was carried out on CABIN 69-82, 99-112 and 129-142, and 25 cu. m were hand trenched on CABIN 73-76.

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MIDWAY (TOOT)	Zinc, Lead, Silver
Cordilleran Engineering;	Barite Stratiform
Regional Resources Ltd.;	105 B 1 (61)
Amax of Canada Limited	(60°02'N,130°12'W)

Claims: MID 1-240

Source: Summary by P. Watson from assessment report 090892 by J.J. Hylands, A.R. Hildebrand, S.E. Parry and J.D. Rowe.

History:

The property consists of 240 claims in the Yukon Territory and 1,041 units in British Columbia (WAY, BULL, MACC, CLIMAX and POST claims). The claims were staked in 1980, 1981 and 1982 by Cordilleran Engineering for Regional Resources Ltd., following a stream sediment geochemical sampling and prospecting program in 1980. In 1981, the property was optioned to Amax of Canada Limited. The property is connected to the Alaska Highway by a 28 km four-wheel drive road, south from km 1136.

Description:

Lower to Middle Paleozoic sedimentary rocks underlies much of the area and are intruded to the west by the Cretaceous Cassiar Batholith. On the property, Silurian to Middle Devonian quartzites and dolostones are overlain by an Upper Devonian clastic sequence containing stratiform mineralization. At the base of this sequence, a carbonaceous argillite unit locally contains a 1-2 m thick sulphide bed (Fe, Pb, Zn, Ag) which grades laterally into siliceous pyritic exhalite. It is overlain by massive with laminated sandstone and minor interbedded argillite and conglomerate which, in turn, is overlain by laminated argillite with interbedded sandstone. A 20 to 100 m thick section at the base of this argillite is highly siliceous, with local interbeds of calcareous sandstone. It hosts several siliceous, pyritic, baritic exhalite horizons, and locally, two stratiform sulphide beds. This is overlain by another unit of massive and laminated sandstone with minor interbedded argillite and conglomerate, followed by massive to strongly laminated argillite with local thin beds of siliceous baritic exhalite. Overlying this is a thick package of rocks consisting of interbedded phyllite and quartzite, with local sandstone, argillite and green chert, which appear to be more metamorphosed than the underlying rocks. A cyclical sequence of quartzite overlain by calcareous sandstone and phyllite is common. The youngest package of rocks present on the property are Mississippian, possibly allochthonous, upper Sylvester Group basalt, dacite and rhyolite flows and related intrusive rocks.

Current Work and Results:

The 1981 program included mapping, airborne and ground geophysics, trenching and soil geochemical sampling on two grid areas (2,546 samples).

A minor amount of trenching (215 m length) in five trenches was done on the Yukon claims. Airborne EM and magnetic surveys were carried out over the entire property. Most EM conductors are long, wide, gently dipping and at some depth below surface. There was minimal magnetic response. The gravity survey, carried out over a small part of the Yukon claims, did not produce any significant results. A horizontal loop pulse EM survey conducted on the same grid outlined three conductive areas of interest.

Mineralization, consisting of stratiform pyrite, sphalerite and galena, is hosted by siliceous and/or baritic exhalites on the B.C. claims. The siliceous exhalite, 95% very fine-grained silica, contains finely disseminated pyrite and 1-3% laminated and disseminated barite. This appears to grade laterally into nodular, lensoid barite and silica and occasionally into massive laminated barite. Local massive sulphide beds are commonly highly siliceous and may represent lateral equivalents of the silica exhalites. Three barite showings have been located on the Yukon claims.

In 1981, drilling on the B.C. portion of the property intersected the Discovery zone, which ranged from 4.5 to 11.0 m true thickness, and, in one hole graded 9.29% Pb-Zn and 86.4 g Ag/t. Above this, the Upper zone has similar grades over 0.5 to 3.2 m. The Lower zone varies from 0.9 to 2.4 m in thickness and in one hole grades 15.24% Pb-Zn and 484.8 g Ag/t over 2.4 m (from news release). These zones are open to extension.

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LICK	Geochemical Target
Canadian Occidental	105 B 2 (64)
Petroleum Limited	(60°03'N,130°45'W)

Reference: GSC Open File Report 563.

Claims: LICK 1-8, 11-16, 23-28, 40-55

Source: Summary by P. Watson from assessment report 090629 by E.J. Sacks, and assessment report 090865 by M.J. Crandall.

History:

The property was staked in 1979 to cover a GSC -URP uranium-silver stream sediment anomaly (144 ppm U, 1-2 ppm Ag). The LICK 40-56 claims were added to the south and west in 1980.

Description:

Jurassic-Cretaceous biotite-(muscovite)-quartz monzonite of the Cassiar Batholith has intruded Devonian-Mississippian metasedimentary rocks (biotite-chlorite-feldspar schist and quartz-feldspar gneiss) in this area. Numerous brecciated, limonite and chlorite-rich shear zones, up to 3 m wide, occur in the intrusive, and veins of chalcedony and quartz occur within, and parallel to them.

Current Work and Results:

Detailed geological (1:5,000), geochemical and radiometric surveys were carried out in 1980. A small (4 cm by 30cm) showing of galena with disseminated pyrite (hand sample assay 1.16% Pb, 495 ppm Zn, 15.0 ppm Ag) was found in a quartz vein in the sheared quartz monzonite, with small lenses of pyrite in the surrounding intrusive rocks. Limonite staining is along the shear zone for 10 m from the showing, and other inaccessible limonite stains may indicate further mineralization.

During the geochemical survey, 59 rocks, 406 soil, 21 stream sediment, 16 stream water and 3 heavy mineral samples were collected. Rock samples were considered anomalous if they contained greater than 200 ppm Pb, 200 ppm Zn or 1.0 ppm Ag. All three rock types have similar mean values of lead and silver, but the mean value for zinc was much greater for the meta-sedimentary rocks. Stream sediment, stream water and soil samples provided comparable anomalies. Soil samples were considered anomalous if values greater than 70 ppm Pb, 180 ppm Zn or 1.0 ppm Ag were obtained. Six anomalous zones were delineated, the largest of which extends 1,200 m by 200-800 m. All generally parallel the metasedimentary rock-intrusive rock contact. Radiometric measurements were taken at most soil sample sites and show a general correspondence to soil sample results. Readings taken over quartz monzonite were higher (130-370 cps) than those taken over metasedimentary rocks (71-299 cps).

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GOAT	Skarn, Vein Target
Canadian Occidental	105 B 2 (65)
Petroleum Limited	(60°10'N,130°40'W)

Reference: GSC Open File Report 563.

Claims: GOAT 1-86

Source: Summary by P. Watson from assessment report 090632 by E.J. Sacks, assessment report 090841 by R.M. Kuehnbaum and assessment report 090977 by M.J. Crandall.

History:

The GOAT 1-36 claims, approximately 8 km north of Rancheria, were staked in 1979 to cover the headwaters of streams reported by the GSC-URP to contain anomalous uranium in stream sediments. The GOAT 37-84 claims were added to the northeast in 1980 to cover scheelite-bearing skarn float, and GOAT 85-86 were added near the end of the season to cover a galena-sphalerite occurrence.

Description:

The property is underlain by a sequence of regionally metamorphosed Lower Cambrian and (?)earlier clastic and carbonate sedimentary rocks (Windermere or Atan Group), intruded by at least three phases of Jurassic to Cretaceous intrusive rocks of the Cassiar Batholith (diorite to granodiorite; biotite-quartz monzonite; and biotite-muscovite-quartz monzonite).

The metasedimentary rocks generally occur as large xenoliths and/or septa within the intrusions, and consist of micaceous quartzites, quartzitic schists and numerous horizons of recrystallized limestone.

Skarns are abundant, their distribution erratic, and their size generally small (2 cm to 5 m thick). Most common are calc-silicate skarns rich in garnet and diopside with occasional rare molybdenite, chalcopyrite and scheelite. Within some, a sulphide skarn containing from 10 to 90% pyrrhotite or pyrite along with minor scheelite, chalcopyrite and molybdenite is found.

Structurally controlled vein or fracture related Zn ± Pb ± Ag mineralization is also found on the property. Northeast-trending, highly brecciated and limonite-rich shear zones up to 3 m wide and 30 m long occur in the intrusions. Narrow muscovite pegmatite veins and local accumulations of pyrite ± galena ± sphalerite occur in the shear zones.

Current Work and Results:

Reconnaissance geological and geochemical surveys were carried out in 1979. The 1980 program consisted of detailed geological, geochemical and radiometric surveys. In 1981, follow-up geological, geochemical and geophysical programs were conducted.

In 1979, 25 rock, 4 heavy mineral, 31 stream sediment and 28 stream water samples were collected and analyzed for up to 12 elements. Significant anomalies in uranium were found in the sediments of streams draining muscovite-bearing quartz monzonite in the north and south-central portion of the initial claim block. Uranium values in stream waters generally conformed with sediment results, and soil samples helped to define the source area for the uranium anomalies. Uranium was found in rocks associated with altered shear zones within the intrusion.

In 1980, 95 rock, 9 heavy mineral, 27 stream sediment and 100 soil samples were collected. Radiometric readings were taken at all soil and stream sediment sample sites. Analyses for Mo, Cu, Pb, Zn, Ag and W ± Sn, U and Th were performed.

No economic values of tungsten or tin were reported. The calc-silicate skarns were slightly more enriched in tin, tungsten and molybdenum than the sulphide skarns, which contained more copper, lead, zinc and silver.

Seven anomalous zones were defined by soil geochemistry for some or all of copper, tungsten, zinc, molybdenum, lead and silver, many of which can be related to known mineralization. Stream sediment values reflect the values found in soils and only a few, randomly distributed anomalous radiometric readings were recorded.

A more detailed examination of the skarns was made in 1981, but no significant new mineralization was outlined. A total of 80 rock samples were collected and analyzed for Cu, Pb, Zn, Ag and W.

Five grids were established for soil geochemistry, VLF-EM and magnetometer surveys in 1981. Some or all of Pb, Zn, Ag, Cu, W and Mo were analyzed for in 542 soil samples. Samples were considered anomalous if they contained greater than 80 ppm Pb, 240 ppm Zn, 0.4 ppm Ag, 60 ppm Cu, 3 ppm W or 5 ppm Mo. Five anomalies were indicated. Two Pb-Zn-Ag anomalies were located at the base of talus slopes just below mineralized fracture zones. VLF-EM conductive zones and magnetic highs generally trended north-south and probably delineate granodiorite contacts or pyrrhotitic quartzite layers. Nine soil pits were dug to test geophysical anomalies.

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URSUS
SEREM Limited

105 B 8,9 (69)
(60°28'N,130°22'W)

Claims: URSUS 1-164

Source: Summary by P. Watson from assessment report 090876 by M. Stammers.

History:

The URSUS 1-104 claims were staked in 1980, and URSUS 105-164 were added later in 1980, following a preliminary examination of the property.

Description:

The area is underlain by Lower Cambrian quartz-biotite schist and quartzite intruded by sills, dykes and irregular bodies of pegmatite. The northern part of the property is dominated by the pegmatitic phases, probably related to the nearby stocks of Jurassic or Cretaceous bitotite quartz monzonite to granodiorite. The southern part of the property is dominated by the quartz-mica schists, which are interbedded with minor amounts of garnet skarn, recrystallized limestone and quartzite.

Current Work and Results:

Geological, geochemical and magnetometer surveys were conducted in 1981. A total of 75 rock, 415 soil, 247 stream sediment and 50 panned or sieved stream sediment samples were collected in 1980 and 1981.

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TEAM
SEREM Limited

Zinc, Tungsten
Skarn
105 B 10, 15 (72)
(60°44'N,130°48'W)

Reference: D.I.A.N.D. (1981, p. 157).

Claims: TEAM 1-206

Source: Summary by P. Watson from assessment report 091011 by M.A. Stammers, M. Vulimiri and P. Tegart.

Current Work and Results:

The TEAM 121-206 claims were added in August, 1981. Mapping was carried out at various scales including 1:5,000, 1:2,000 and 1:200. In addition, 644 soil samples were collected, a proton magnetometer survey conducted and approximately 500 m^3 excavated in 17 trenches and four pits.

The Hadrynian "Grit Unit" is comprised of ± calcareous quartz-biotite ± muscovite schist, calcareous and non-calcareous phyllite, quartzite and metamorphosed quartz-grit and fine-pebble conglomerate. Schist is the most common of these units. They are intruded by a multiphase, two-mica granodiorite to quartz monzonite.

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WOLF
Cordilleran Engineering,
(Regional Resources Ltd);
Amax of Canada Limited

Zinc, Lead, Copper
Silver Stratabound
105 B 9 (74)
(60°33'N,130°02'W)

Reference: D.I.A.N.D. (1981, p. 157).

Claims: WOLF 1-52

Source: Summary by P. Watson from assessment report 090671 by P.A. Cartwright and P.G. Hall and assessment report 090903 by D.J. Gregory.

Current Work and Results:

In 1980, induced polarization, resistivity, VLF-EM and proton total field magnetometer surveys were carried out on 18 km of line. No discrete trends were identified by the magnetometer survey although several interesting zones were indicated by the I.P. survey. Generally I.P. and VLF-EM results did not show good correlations. Those locations which did show good correlation were believed to indicate sources close to the surface (less than 100 m). Four anomalous zones were delineated by these surveys.

In 1981, four BQ diamond drill holes were completed for a total of 582.2 m through phyllite, argillite and quartzite with garnet-mica schist to test geophysical and geochemical anomalies. Narrow widths of sub-economic grade mineralization in veins were encountered in all of the holes and trace pyrite was noted throughout. The fourth hole failed to intersect the projected down-dip extension of the discovery showing. Mineralization assaying 0.625% Pb, 1.54% Zn and 16.5 g Ag/t over four metres was reported from hole one, with trace pyrite occurring throughout, and trace galena, sphalerite and siderite noted in some quartz veins.

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ICE
Canadian Occidental
Petroleum Limited

Geochemical Target
105 B 6 (75)
(60°18'N,131°30'W)

Reference: D.I.A.N.D. (1981, p. 158)
GSC Open File Report 563

Claims: ICE 1-30

Source: Summary by P. Watson from assessment report 090633 by E.J. Sacks.

History:

The ICE 1-30 claims were staked in 1979 to cover the headwaters of a stream sediment anomaly (13 ppm Mo and 42 ppm U) reported from the GSC-URP. The ICE claims were staked north of the HL claims, which covered the immediate headwaters.

Description:

The claims are underlain by Jurassic and/or Cretaceous quartz monzonite and granodiorite of the Cassiar Batholith. No visible mineralization was reported.

Current Work and Results:

Preliminary geological and geochemical surveys were conducted in 1979. Seven rock samples were collected and analyzed for U, Th, Mo and F, and 4 stream water samples were analyzed for U, F and As. Four stream sediment and 31 soil samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, U, Th, Sn and W.

Significant contents of uranium (0.063% U_3O_8), tungsten (5 ppm) and molybdenum (20 ppm) occur in stream sediments draining the biotite-quartz monzonite in the eastern part of the claims. Stream water analyses correspond to stream sediment values and rocks from this area contain up to 7.5 ppm uranium.

A uranium-molybdenum soil anomaly (up to 150 ppm U and 23 ppm Mo) occurs in the east and southeast parts of the claim block, and correlates well with other geochemical results. Several weaker uranium-molybdenum -tungsten anomalies, mainly in soils, occur elsewhere on the claims.

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MR	Zinc, Lead, Silver
Cordilleran Engineering;	105 B 1, 8 (87)
Regional Resources Ltd.	(60°17'N,130°18'W)

Claims: MR (230)

Current Work and Results:

Two showings have been found. The East Showing consists of disseminated and massive pyrite-galena -sphalerite in graphitic and calcareous phyllites and limestones of Lower Cambrian age. The West Showing is indicated by an approximately 100 m long zinc-silver -rich ferricrete gossan at a fault(?) contact between graphitic phyllite and limestone.

During 1981, 164 claims were mapped at a scale of 1:10,000, and over 1,000 soil samples were collected at 50 m intervals from three grid areas and analyzed for Cu, Pb, Zn, Ag and Ba. In addition, 282 line km of Dighem II airborne EM and magnetometer surveys were flown, and approximately 30 cu. m were excavated from the West Showing. Several zones of anomalous, multiple -element soil geochemical response were defined along a prominent EM-conductive and low resistivity trend over the phyllite host unit.

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STONEAXE	
SEREM Limited	105 B 10, 15 (88)
	(60°44'N,130°57'W)

Claims: STONEAXE 1-30; GEE WIS 1-8

Source: Summary by P. Watson from assessment report 091009 by M.A. Stammers.

Description:

The STONEAXE claims overlie a northwest-trending contact between the Gravel Creek Stock (possibly a satellite intrusion of the Cassiar Batholith) and late Precambrian schist. The GEE WIS claims adjoin the STONEAXE claims to the northeast and are not covered by this report.

Current Work and Results:

The STONEAXE claims were staked in 1981. Mapping was carried out at a scale of 1:5,000 and ninety soil samples were collected.

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BORDER	Geochemical Target
Canadian Occidental	105 B 2,104 O 15 (91)
Petroleum Limited	(60° 00'N, 130° 40'W)

References: GSC Open File Reports 561 and 563.

Claims: BORDER 1-8 (see also Liard Mining Division, British Columbia; ALLEN #1 - Units 1-15; and ALLEN #2 - Units 1-15).

Source: Summary by P. Watson from assessment report 090631 by E.J. Sacks, and assessment report 090840 by C. Hartley.

Description:

The BORDER 1-8 and ALLEN #1 AND #2 (B.C.) claims were staked in 1979 to cover a multi-site GSC-URP stream sediment lead-zinc-silver-copper-uranium anomaly. Mid-Cretaceous biotite ± muscovite quartz monzonite and granodiorite of the Cassiar Batholith underlies this area, cut by narrow (less than 1 m) diabase dykes and small hornblende diorite stocks within the ALLEN claims. The quartz monzonite is foliated and brecciated and cut by chloritized, saussuritized, kaolinized and limonitized fracture zones containing rare quartz -pyrite veining.

Current Work and Results:

Geological, geochemical and radiometric surveys were conducted in 1979 and/or 1980. During the 1979 program, 2 heavy mineral, 21 stream sediment, 21 stream water, 14 soil and 22 rock samples were collected. Anomalous values of lead, zinc, silver and uranium were found in rocks especially in fracture zones. Strong, persistent lead, zinc, silver, uranium, tungsten and molybdenum anomalies were reported for soil, stream sediment and heavy mineral samples from the ALLEN claims.

In 1980, 153 soil (54 on BORDER), 1 heavy mineral, 1 stream sediment and 34 rock (18 on BORDER) samples were collected and analyzed for some or all of Pb, Zn, Ag, Cu, Mo and U. Soils were considered anomalous if they contained greater than 50 ppm Pb, 120 ppm Zn or 0.4 ppm Ag. Twelve anomalous areas (lead-zinc -silver) were reported, apparently related to shear zones and small intrusives.

Radiometric surveys, taken in conjunction with soil geochemistry, did not provide any interesting results.

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CO
Canadian Occidental
Petroleum Limited

Geochemical Target
105 B 12 (92)
(60°34'N,131°50'W)

Reference: GSC Open File Report 563.

Claims: CO 1-36

Source: Summary by P. Watson from assessment report 090635 by E.J. Sacks.

History:

The CO claims were staked in 1979 to cover the headwaters of a U-Cu-Mo-F stream sediment-water anomaly reported by the GSC-URP.

Description:

The claims are underlain by Pleistocene glacial sediments and probably underlain by regionally metamorphosed, Devonian to Mississippian quartzite and other metasedimentary rocks, and by quartz veins and younger, unmetamorphosed, plagioclase porphyry andesite dykes.

Current Work and Results:

No outcrop was found on the property during the 1979 preliminary geological and geochemical surveys. A total of 49 soil, 2 stream sediment and 2 water samples were collected from the property, as well as 3 rock samples from the surrounding area. Soils and sediments were analyzed for Cu, Mo, Pb, Zn, Ag, U and Th. Rocks were analyzed for U, Th and F, and waters for U, F and As. No anomalous stream sediment values were reported, and copper and uranium values did not replicate GSC results from the same streams. A 610 m long uranium-molybdenum-copper soil anomaly was located in the southwest corner of the claim group. No source of uranium on these claims has been found to date.

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1981 MINERAL CLAIMS STAKED

MIDWAY (TOOT) — 105 B 1 (61)
Amax of Canada Limited — (60°01'N,130°14'W)

Claims 1981: MID (80)

MAC — 105 B 1 (84)
Marbaco Resources — (60°03'N,130°20'W)

Claims 1981: MAC (4)

KERNS — 105 B 1 (15)
D. Schellenberg et al — (60°13'N,130°23'W)

Claims 1981: DPS (8)

DALE — 105 B 1 (6)
C. Wilman et al — (60°00'N,130°28'W)

Claims 1981: VIC (8); GP (8); LOLA (8); BERT (8); ANNE (8)

LOST — 105 B 2 (85)
Canadian Occidental Petroleum; G. Aylward — (60°10'N,130°33'W)

Claims 1981: LOST (4); GARRY (4)

SLOUCE — 105 B 3 (50)
McPres Mineral Exploration — (60°03'N,131°26'W)

Claims 1981: BT (24)

SIN — 105 B 3 (48)
Welcome North Mines Limited — (60°09'N,131°27'W)

Claims 1981: SIN (2)

LOGTUNG — 105 B 4 (30)
Amax of Canada Limited — (60°01'N,131°43'W)

Claims 1981: LOG (12)

I — 105 B 4 (47)
McPres Mineral Exploration — (60°15'N,131°04'W)

Claims 1981: TB (24)

PINESOL — 105 B 7 (86)
C. Main et al — (60°22'N,130°49'W)

Claims 1981: PINESOL (16)

MID — 105 B 7 (18)
R.W. Hyde et al — (60°20'N,130°42'W)

Claims 1981: CMC (112)

MR — 105 B 8 (87)
Regional Resources — (60°17'N,130°17'W)

Claims 1981: MR (230)

TEAM — 105 B 10, 15 (72)
SEREM Limited — (60°43'N,130°46'W)

Claims 1981: TEAM (86)

STONEAXE — 105 B 10, 15 (88)
SEREM Limited — (60°45'N,130°54'W)

Claims 1981: STONEAXE (30); GEE WIS (8)

THRALL
Getty Canadian Metals

105 B 11 (89)
(60°32'N,131°20'W)

Claims 1981: THRALL (92)

SOURCE
SEREM Limited

105 B 11 (90)
(60°38'N,131°09'W)

Claims 1981: SOURCE (24)

PORCUPINE
G. Desbiens et al

105 B 16 (41)
(60°58'N,130°02'W)

Claims 1981: SPRUCE (2); PINE (2); BIRCH (2); HEMLOCK (2); MAPLE (2)

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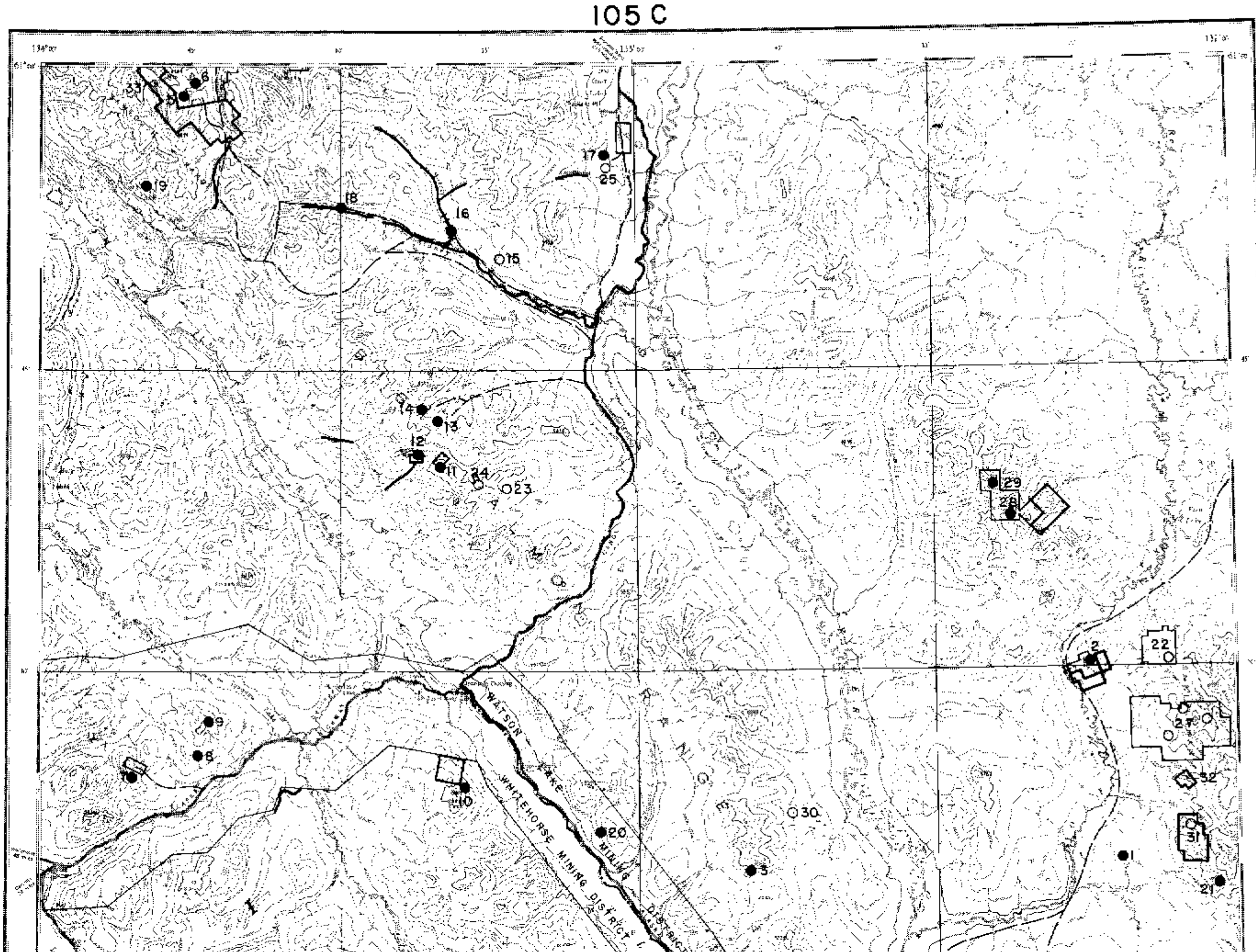
105 C



TESLIN
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ● 61 .... Mineral Deposit or Occurrence see key on facing page
- ○ 72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ...... Mineral Claims staked in 1981
- ..... Prospecting Leases in good standing (April 1982)
- ..... Placer Claims in good standing (April 1982)
- CEL........ Coal Exploration Licence
- CML........ Coal Mining Lease
- ...... Tote Trail
- ...... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

TESLIN MAP-AREA (NTS 105 C)

General Reference: GSC Map 1125A and Memoir 326 by: R. Mulligan, 1963.

NO.	PROPERTY NAME	REFERENCE
1	KITCHEN	Silver-Lead Vein
2	SMEG	This Report
3	LINCOLN	Mulligan (1963, p. 78)
4	TARFU	
5	SLATE	Silver-Lead-Zinc Vein
6	RED MOUNTAIN	This Report
7	RIBA	Asbestos
8	SEAFORTH	Asbestos
9	SQUANGA	Asbestos
10	HAYES PEAK	Mulligan (1963, p. 78); This Report
11	GUNSIGHT	D.I.A.N.D. (1981, p. 162)
12	MOOSE HILL	Lees (1936, p. 24); This Report
13	MARLIN	Manganese Occurrence
14	MT. GRANT	Copper Vein
15	DRY	
16	IRON CREEK	Silver-Gold Occurrence
17	LINDSAY	Craig & Laporte (1972, p. 124)
18	SIDNEY	Mulligan (1963, p. 77)
19	ROSY	Bostock (1936, p. 6)
20	DEADMAN	Silver-Lead Vein
21	McCLEERY	Skarn-Copper Iron
22	ABBA	D.I.A.N.D. (1981, p. 161)
23	FORSURE	D.I.A.N.D. (1981, p. 162)
24	CHRIS	D.I.A.N.D. (1981, p. 162)
25	LINDSAY	D.I.A.N.D. (1981, p. 162)
26	LISA	D.I.A.N.D. (1981, p. 162)
27	MICH	D.I.A.N.D. (1981, p. 162)
28	ORK	This Report
29	MINDY	This Report
30	STARTIP	Morin et al (1979, p. 78-79)
31	DB	This Report
32	BAS	This Report
33	GRIZZLY	This Report

SMEG — Lead, Zinc, Silver, Barite Stratabound
Chevron Standard Minerals Limited
105 C 8, 9 (2)
(60°38'N, 132°22'W)

References: D.I.A.N.D. (1981, p. 161); Morin et al (1980, p. 59-60).

Claims: BAR (44)

Current Work and Results:

In 1981, 14 claims were mapped at a scale of 1:25,000 to define the stratigraphy and structure of the central part of the claim block.

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RED MOUNTAIN — Molybdenum
Amoco Canada Petroleum Company Limited
105 C 13 (6)
(60°59'N, 133°45'W)

References: Morin et al (1980, p. 33); Morin et al (1977, p. 148); Sinclair et al (1976), p. 96-97); Craig and Laporte (1972, p. 121-122).

Claims: BUG, GUB, SM

Source: Summary by P. Watson from assessment report 090887 by P. Brown.

Current Work and Results:

Six HQ diamond drill holes, totalling 3,963 m, were completed in 1981. The best intersection was found in hole 24 which was drilled at -90° to 921.4 m. From 405 m to 921.4 m (516.4 m length) graded 0.31% MoS_2, while from 849 m to 921.4 m (72.4 m) graded 0.41% MoS_2. These holes intersected quartz monzonite porphyry with quartz stockwork, hornfels and quartz eye diorite.

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ORK
J.C. Stephen
Explorations Ltd.;
(D.C.Syndicate)

Tin, Tungsten Skarn
105 C 9 (28)
(60°38'N, 132°22'W)

Reference: D.I.A.N.D. (1981, p. 162).

Claims: ORK 1-36

Source: Summary by P. Watson from assessment report 090886 by J.C. Stephen.

Current Work and Results:

During the 1981 program of mapping, sampling and prospecting, 3 silt, 46 talus and 49 rock samples were collected and analyzed for Sn and W. Limited exposure of a leucocratic granitic intrusive was indicated with anomalous values of Sn and W occurring in the vicinity. Skarn horizons in the northern part of the property have related mineralization, but no significant mineralized zone has been demonstrated to date.

******

MINDY
Newmont Exploration
of Canada Limited

Tungsten Tin Skarn
105 C 9 (29)
(60°37'N,132°20'W)

Reference: D.I.A.N.D. (1981, p. 162)

Claims: MINDY 1-16, 33-64

Source: Summary by P. Watson from assessment report 090647 by H. Limion and assessment report 090987 by D. Oneschuk.

History:

The MINDY 1-16 claims were staked in 1979 and the neighbouring MINDY 17-32 (D.I.A.N.D.,1981, p. 162) added in 1980.

Description:

The MINDY claims are underlain by Mississippian sedimentary rocks, including hornfels, chert, argillite, limestone, conglomerate and skarn. The nearest intrusion (Mulligan, 1963) outcrops 6.5 km to the northwest, and a shallow intrusion is postulated under the claims to account for the hornfels and skarn in this area.

Current Work and Results:

Three skarns were reported from preliminary mapping. One is 10 m wide, may extend for up to 500 m in strike length, contains sparsely disseminated arsenopyrite, pyrrhotite and scheelite, and is cut by a 1.3 m wide massive pyrrhotite vein. A grab sample of float from the second skarn assayed 0.31% Sn and also contained minor chalcopyrite, sphalerite and smithsonite. The third, sulphide-free, skarn contains irregular garnet-rich zones, one of which assayed 0.42% WO_3 over 2 m.

A MAXMIN-EM survey, carried out in 1979 over the central part of the claims, failed to detect any strong conductive features, although several weak indications of conductive material exist. The magnetic survey defined two magnetically active zones, one to the south of the first skarn showing and one coincident with the weak EM anomalies. The latter zone is approximately 400 m long and up to 300 m wide.

In 1981, a total of 1,047 m of diamond drilling was completed in nine holes. The holes encountered biotite hornfels, skarn and chert, plus minor amounts of other units. In three holes, approximately 18 m of skarn were intersected. Other holes encountered minor to nine m of skarn, often in more than one location. Assays of 0.467% Sn over 6.8 m and 0.54% Sn over 7.6 m were reported. Assays for WO_3, Cu, Zn, Ag and Au were generally very low.

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DB
J.C. Stephen
Explorations Ltd.

Tin Tungsten Skarn
105 C 8 (31)
(60°22'N,132°05'W)

Reference: Morin et al (1980, p. 59).

Claims: FF 1-46

Source: Summary by P. Watson from assessment report 090993 by J.C. Stephen.

History:

FF 1-16 were staked in June 1981 for D.C. Syndicate and the remainder of the block added in August, 1981. The DB claims were staked in the same area in 1978 but later lapsed.

Description:

Five rock units are present. The oldest unit consists of Mississippian or older quartzite, argillaceous quartzite and tuff(?) of the Big Salmon Complex and underlies the skarn unit. Within the skarn, a dark red-garnet skarn is separated from an upper green-garnet skarn by a discontinuous bed of limestone. Some sections contain concentrations of magnetite, and elsewhere, local pods of pyrrhotite with small amounts of chalcopyrite, pyrite and arsenopyrite are found. Smaller skarn zones contain some Sn and W mineralization. The skarn is overlain by well-bedded limestone, and then by a unit of argillaceous quartzite with interbedded shale, argillite and chert. Granite of the Hake Batholith has cut these older units.

Current Work and Results:

The 1981 program consisted mainly of chip sampling at 30 m intervals along the various skarn horizons. The main skarn zone extends for approximately 640 m and was divided into six zones along its length. Low values in tin and tungsten were obtained.

******

BAS
J.C. Stephen
Explorations Ltd.

Skarn
105 C 8 (32)
(60°24'N,132°05'W)

Claims: BAS 1-8

Source: Summary by P. Watson from assessment report 090994 by J.C. Stephen and M.M. Brenchley.

History:

The claims were staked on behalf of D.C. Syndicate in 1981 to cover a thick zone of calc-silicate skarn discovered while prospecting the contact area of the Hake Batholith.

Description:

Six rock units are present, the oldest of which are probably Mississippian or earlier. The lowermost unit is a siltstone and is overlain by a dolomite -silicified limestone unit which occurs as two bands separated by a calc-silicate skarn. The lower dolomite contains pockets of highly gossaned carbonate rocks with small quantities of chalcopyrite and pyrrhotite. The calc-silicate skarn contains lenses and stringers of magnetite, is from 23 to 61 m thick and can be traced for 915 m along strike. Overlying the carbonate unit are siltstones and volcanics, and the area has been intruded by the Hake Batholith.

Current Work and Results:

In 1981, stream sediment, talus, soil and chip geochemical sampling, and geological mapping were carried out. Samples were analyzed for Sn and W, which were slightly anomalous in stream sediment samples, slightly more anomalous in talus, and not anomalous at all in chip samples taken across the skarn.

******

1981 MINERAL CLAIMS STAKED

HAYES PEAK
T. McCrory et al
105 C 6 (10)
(60°25'N,133°19'W)

Claims 1981: SAYEH (25)

DB
D. Ferguson et al
105 C 8 (31)
(60°21'N,132°05'W)

Claims 1981: FF (46)

BAS
M. Brenchley
105 C 8 (32)
(60°24'N,132°05'W)

Claims 1981: BAS (8)

SMEG
Chevron Canada
105 C 8 (2)
(60°38'N,132°22'W)

Claims 1981: BAR (24)

MINDY
Newmont Exploration of Canada
105 C 9 (29)
(60°39'N,132°25'W)

Claims 1981: MINDY (32)

MOOSE HILL
J. Suits
105 C 11 (12)
(60°40'N,133°22'W)

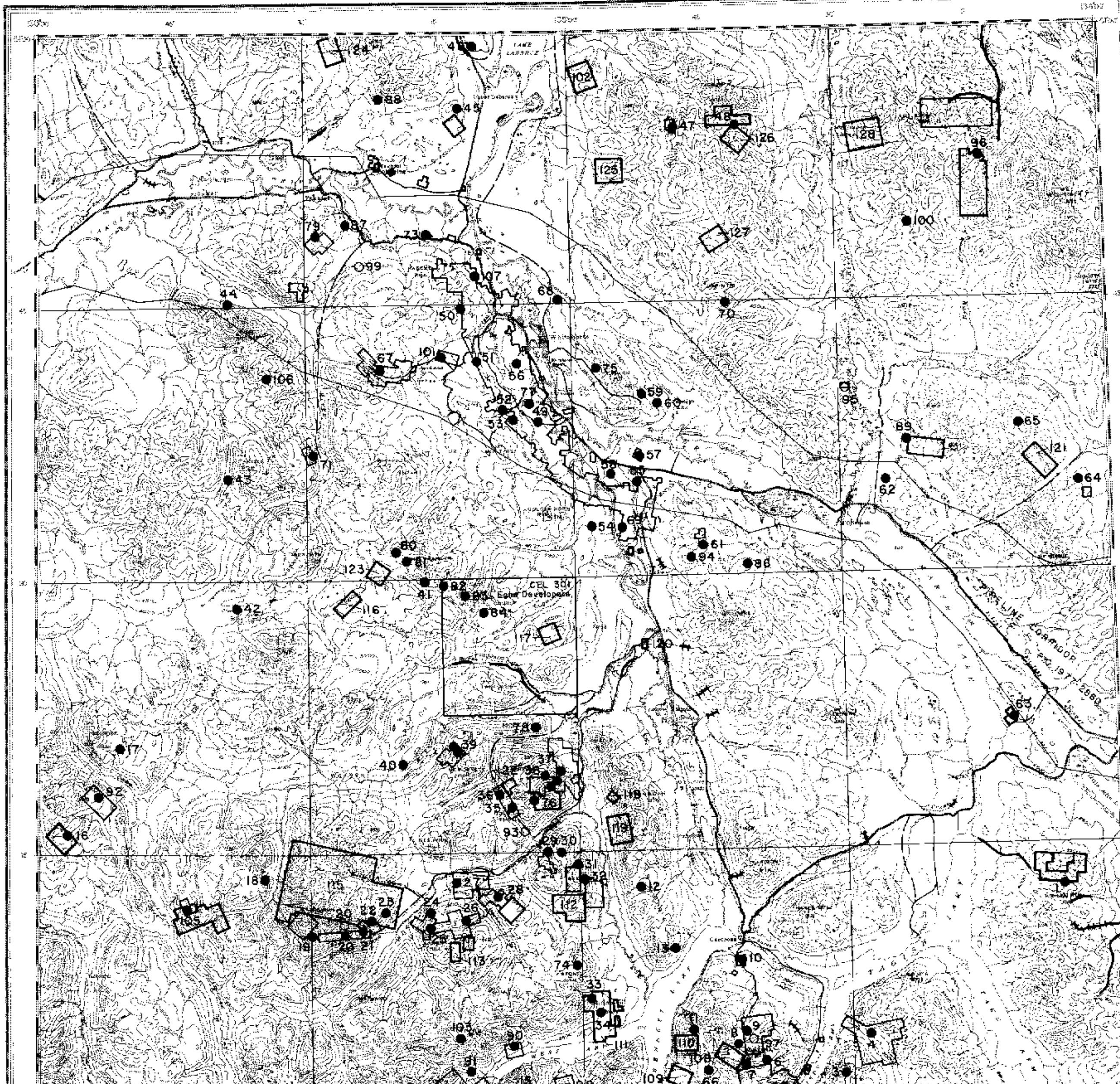
Claims 1981: CONE (4)

GRIZZLY
D. Fraser et al
105 C 13 (33)
(60°58'N,133°47'W)

Claims 1981: GRIZZLY (80); YR (24); BEAR (52)

******

105 D



WHITEHORSE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- ○72 .... Unmineralized Target
- .... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- .... Mineral Claims staked in 1981
- .... Prospecting Leases in good standing (April 1982)
- .... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- .... Tote Trail
- .... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

WHITEHORSE MAP-AREA (NTS 105 D)

General Reference: GSC Map 1093A and Memoir 312 by: J.O. Wheeler, 1961.

NO.	PROPERTY NAME	REFERENCE
1	JUBILEE	This Report
2	LULU	Findlay (1969b, p. 39)
3	MILLET	Copper
4	LIME	D.I.A.N.D. (1981, p. 165)
5	VENUS	D.I.A.N.D. (1981, p. 23-25, 68-76, 116-122); This Report
6	MONTANA	Findlay (1969a, p. 60-61)
7	THISTLE	Gold-Silver-Lead-Zinc-Copper Vein
8	JEAN	Green & Godwin (1964, p. 39-40); Findlay (1969a, p. 61)
9	BIG THING	D.I.A.N.D. (1981, p. 167)
10	CARCROSS	Findlay (1969a, p. 62); This Report
11	KNOB HILL	Bostock (1941, p. 143)
12	WABONA	Zinc Vein
13	COLLEGE GREEN	Copper Vein
14	FINGER	Copper Occurrence
15	LATREILLE	D.I.A.N.D. (1981, p. 165)
16	PRIMROSE	Skarn Zinc; This Report
17	ROSE	D.I.A.N.D. (1981, p. 165, 167)
18	BOSTOCK	Bostock (1941, p. 38)
19	CHARLESTON	This Report
20	BERNEY	D.I.A.N.D. (1981, p. 166, 168)
21	MT. REID	This Report
22	SKUKUM	Findlay (1969a, p. 56-57); Craig & Milner (1975, p. 55)
23	MORNING	Bostock (1941, p. 36-37); This Report
24	GODDELL	Antimony-Silver Vein
25	PORTER	Bostock (1941, p. 37-38); D.I.A.N.D. (1981, p. 168)
26	BECKER-COCHRAN	Green (1966, p. 52-55)
27	FLEMING	Wheeler (1961, p. 142); Cairnes (1912, p. 140-145)
28	MT. ANDERSON	D.I.A.N.D. (1981, p. 166); This Report
29	TALLY-HO	Wheeler (1961, p. 108-110)
30	MT. WHEATON	Wheeler (1961, p. 122-123)
31	BUFFALO	This Report
32	MT. STEVENS	This Report
33	CROMWELL	Silver-Lead-Copper Vein; This Report
34	MILLHAVEN	This Report
35	GOLD HILL	Cairnes (1916, p. 43)
36	GOLD REEF	Wheeler (1961, p. 123); Cairnes (1912, p. 111-112)
37	UNION MINES	Wheeler (1961, p. 135-136)
38	MT. BUSH	Cairnes (1916, p. 145-147)
39	LEGAL TENDER	Cairnes (1912, p. 112-113)
40	ALLIGATOR	Copper-Molybdenum Porphyry
41	WHITEHORSE COAL	Craig & Laporte (1972, p. 158)
42	MUD	Findlay (1969a, p. 54-55)
43	ARKELL	Craig & Milner (1975, p. 43)
44	INGRAM	Wheeler (1961, p. 136-137)
45	CUTOFF	Silver-Gold Vein; This Report
46	EFFIE	Asbestos
47	POW	D.I.A.N.D. (1981, p. 166)
48	ACE	Silver-Gold-Lead-Zinc-Copper Vein; This Report
49	WHITEHORSE COPPER	Kindle (1963); Sinclair & Gilbert (1975, p. 74-77); This Report
50	TREMAR	Craig & Laporte (1972, p. 113)
51	WING	
52	QUINALTA	Skarn Copper
53	POLAR	Kindle (1963, p. 35-36)
54	VAL	Copper-Molybdenum Occurrence
55	DUGDALE	Findlay (1969a, p. 54)
56	TOPAZIOS	Findlay (1969b, p. 34)
57	LEWES RIVER	Findlay (1969b, p. 34-35)
58	WALCOTT	
59	GOLCONDA	Copper-Silver-Lead Vein
60	GRONK	Skarn Copper
61	NIP	Skarn Copper
62	M'CLINTOCK	Wheeler (1961, p. 143); Craig & Milner (1975, p. 45)
63	MARSH	Nickel-Cobalt-Copper Magmatic; This Report
64	LAVALEE	Asbestos
65	MICHIE	Chromium-Asbestos Magmatic
66	RAILROAD	Silver Vein
67	JACKSON	Craig & Milner (1975, p. 52)
68	IMP	Copper Occurrence
69	BUCHANAN	D.I.A.N.D. (1981, p. 168)
70	WHEELER	
71	HARNIAK	Copper-Silver-Gold Vein
72	SHAW	This Report
73	ALLISON	
74	OPULENCE	Antimony Vein
75	BOBO	
76	DONKEY	Silver-Lead-Zinc-Gold-Copper Vein; This Report
77	DAWN	
78	INCO	Copper-Molybdenum Porphyry
79	SUITS	Sinclair et al (1975, p. 144-145)
80	FISH LAKE	Coal
81	LUSCAR	Coal
82	PTARMIGAN	Cairnes (1908, p. 20-21)
83	COAL RIDGE	Coal
84	BERESFORD	Cairnes (1908, p. 20-21)
85	BOUDETTE	Wheeler (1961, p. 143)
86	COMBS	Gold Vein
87	MIDGETT	Copper Vein
88	GEE	D.I.A.N.D. (1981, p. 168)
89	TONY	Lead-Silver-Zinc Vein; This Report
90	WEST	D.I.A.N.D. (1981, p. 166)
91	PART	D.I.A.N.D. (1981, p. 167)
92	PROSE	
93	POMPEI	D.I.A.N.D. (1981, p. 168)
94	LORNE	D.I.A.N.D. (1981, p. 168)
95	JAVA	D.I.A.N.D. (1981, p. 168)
96	GAMMON	This Report
97	ART	D.I.A.N.D. (1981, p. 167)
98	MUNROE	D.I.A.N.D. (1981, p. 167)
99	UNTILL	Sinclair et al (1976, p. 104)
100	ABI	Sinclair et al (1976, p. 108)
101	TOP	Morin et al (1979, p. 61)
102	LABE	This Report
103	CRO	Morin et al (1980, p. 33)
104	BEN	Morin et al (1980, p. 33)
105	RAM	D.I.A.N.D. (1981, p. 123-127); This Report
106	RAMING	Morin et al (1980, p. 36)
107	OJ	Morin et al (1980, p. 36)
108	ATHES	This Report
109	DUNK	This Report

110	UNDAL	This Report
111	TROLL	This Report
112	ODD	This Report
113	BACHUS	This Report
114	NIAD	This Report
115	KUKU	This Report
116	DAYIR	This Report
117	EVIEW	This Report
118	TIKA	This Report
119	ILLIA	This Report
120	AMN	This Report
121	ICHIE	This Report
122	ALBATROS	This Report
123	BEXI	This Report
124	FLAT	This Report
125	ERGE-	This Report
126	UNCER	This Report
127	SLEWE	This Report
128	UTSHIG	This Report

JUBILEE
Nithex Exploration Limited — Gold, 105 D 1 (1) (60°14'N,134°07'W)

Claims: JUBILEE 1-6; JM 1-12, 25-26, 31-34

Source: Summary by P. Watson from assessment report 090864 by J.W. MacLeod.

History:

This showing was known in the 1950's. The JUBILEE 1-6 claims were staked in 1979 and the JM claims added in 1980 and 1981.

Description:

Pyrite and arsenopyrite lenses are found within a limonitic shear within a series of Cretaceous(?) volcanic rocks. A distinct chloritic shear forms the hanging wall to the limonitic mineralized shear. A series of brecciated volcanics, andesites and cherts were mapped in drill core.

Current Work and Results:

Eight hand trenches were dug, four of which expose mineralization consisting of lenses of massive arsenopyrite and pyrite. Samples across 2.3 m in one trench and 1.1 m in another trench assayed 9.94 g Au/t and 11.14 g Au/t respectively.

Six diamond drill holes, totalling 305.6 m, were drilled in 1981 to cut the limonitic shear zone. Two contained no significant gold values, two contained lower values than surface showings and two intersected the main zone. Although considerable disseminated pyrite was found, gold values were only associated with arsenopyrite.

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CHARLESTON
Archer, Cathro and Associates Limited — 105 D 3, 4 (19) (60°12'N,135°30'W)

References: D.I.A.N.D. (1981, p. 165); Wheeler (1961, p. 126-127).

Claims: NOMEN DUBIUM 1-24

Source: Summary by P. Watson from assessment report 090975 by A.R. Archer.

Current Work and Results:

In 1981, prospecting and a soil geochemistry survey were carried out. A prominent quartz vein containing anomalous Au and Ag, and rusty quartz veins and dykes up to 3 m wide, were noted. The rusty veins and dykes outcrop near the densest cluster of anomalous Au values, and a 1 m wide, rusty, porous patch of quartz veining was found which contained up to 50% disseminated sulphides including galena, and possibly tetrahedrite and arsenopyrite.

During the program 141 geochemical samples were collected. Gold anomalies of 1,640 and 794 ppb Au were returned from the quartz vein, and values of 776 and 666 ppb Au from the galena showing. The only anomalous Ag values noted on the property were associated with the quartz vein. Most samples contained greater than 50 ppm As.

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MT. REID
Ernie Bergvinson — Gold, Silver, Antimony, 105 D 3 (21) (60°10'N,135°24'W)

Reference: Sinclair et al (1975, p. 146-147).

Claims: WH 1-8

Source: Summary by P. Watson from assessment report 090871 by F. Holcapek.

Current Work and Results:

Approximately 23 m of old trenches were re-opened and resampled, and prospecting was carried out in the surrounding area in 1981. The main showing is a fault zone up to 15 m wide, with erratically distributed sulphides over a maximum width of 1 m.

******

MT. STEVENS
Island Mining and Explorations Company Limited

Gold, Silver,
105 D 2 (32)
(60°12'N,134°58'W)

Reference: Wheeler (1961, p. 121-122)

Claims: JL 1-24

Source: Summary by P. Watson from assessment report 090894 by F. Holcapek.

History:

Mineralization has been known on Mt. Stevens since the early 1900's. The JL claims, staked in 1980 on the eastern slope of Mt. Stevens, cover several old adits and trenches.

Description:

Volcanic rocks of the Lewes River Group are intruded by granite porphyry and andesite dykes in this area. Gold mineralization is localized within the granite porphyry dykes.

Current Work and Results:

The old showings and workings were re-examined in 1981. Extensively fractured and sericitized quartz porphyry dykes are mineralized with pyrite, galena and minor sphalerite. The mineralization is associated with quartz stockwork or intensive silicification along crosscutting fracture planes or shear zones.

Limited soil and rock geochemical surveys were also carried out in 1981. No gold values greater than 0.10 g/t were reported for rock chip samples from the three showings. Silver values in rock such as 1.03 g/t over 15 m and 2.4 g/t over 5 m were reported. Thirty-five soil samples were collected and coincident lead and gold soil sample anomalies were determined.

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WHITEHORSE COPPER
Whitehorse Copper Mines Limited

Copper, Gold, Silver Skarn
105 D 10,11,14(49)
(60°40'N,135°10'W)

References: D.I.A.N.D. (1981, p. 4, 22, 24-25); Morin et al (1980, p. 35-36).

Claims: Approximately 700 claims

Source: Summary by P. Watson from assessment reports 090645, 090823, 090834 and 090899 by A. Hureau.

Current Work and Results:

During 1981, the entire belt was flown with airborne EM and magnetic surveys. These results are still being evaluated. A total of 51 diamond drill holes of NQ and BQ were drilled on JEAN 11, PUEBLO 1, EMIDELL 13, 15, VERONA, JIM 13, 15 and SUE 3, 4 for a total of 9,362 m. Drilling increased the reserves at COWLEY PARK SOUTH to 213,188 tonnes of 2.46% Cu and 0.14% MoS_2. Erratic, good-grade mineralization was intersected at NORTH STAR at depths to 518 m.

The mine reported 5,333 m of surface diamond drilling and 366 m of raising completed during 1981.

SUMMARY OF OPERATIONS OF WHITEHORSE COPPER MINES LIMITED

	1978	1979	1980	1981
Tonnes Mined	841,406	849,362	778,184	748,833
Tonnes Milled	782,992	829,455	772,864	727,616
Daily Average Milled (tonnes)	2,194	2,278	2,367	2,040
Mill Heads:				
Copper (%)	1.40	1.12	1.58	1.42
Gold (gm/tonne)	.75	.58	.86	1.03
Silver (gm/tonne)	7.76	6.33	9.48	9.26
Metal Production:				
Copper (kg)	9,490,632	7,931,060	10,728,041	9,088,284
Gold (gm)	541,814	492,951	687,439	489,165
Silver (gm)	5,524,950	5,255,598	7,473,336	6,045,370
Metal Sales:				
Net Smelter Return (000,000's $)	18.0	23.5	32.0	32.0
Ore Reserves at Year End:				
Tonnes	2,387,462	2,096,525	1,671,051	1,325,000 *
Copper (%)	1.57	1.50	1.40	1.35
Gold (gm/tonne)	.79	.79	.79	1.03
Silver (gm/tonne)	7.87	7.87	7.87	9.26

* as of December 31, 1981

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SHAW
Kennco Explorations
(Western) Limited

Copper, Lead, Zinc, Silver, Gold Veins
105 D 3 (72)
(60°01'N,135°16'W)

Reference: Lambert (1974).

Claims: GOAT 1-131

Source: Summary by P. Watson from assessment report 090910 by R. Pegg.

History:

Kennco Explorations carried out a regional stream sediment program in 1962-1964. In 1980, samples from this survey were analyzed for Ag and Pb, and the GOAT 1-115 claims were staked. The remaining claims were staked in 1981. In 1972-73, 30 claims were staked by Adastral Mining Corporation Limited on what are now the GOAT claims. Only RIDGE 5, 13 and 17 are still in good standing.

Description:

The property is located 25 km west-southwest of Carcross, approximately at the centre of the Bennett Lake Cauldron Subsidence Complex. This Tertiary resurgent system consists of two nested calderas, and most of the claim block covers the inner caldera. The rocks are dominantly tuffs and felsic ash flow lapilli tuffs containing 1 to 80% fragments. The rocks are moderately to densely welded at the base, with little to no welding near the centre, and vesicular at the top. Six of the 20 units reported by Lambert were mapped on the property: Partridge Lake Formation, Cleft Mountain Formation, McCauley Creek Formation, Crozier breccias, Crozier tuffs and assorted dykes, sills and lavas. The calderas are surrounded by granitic rocks of the Coast Plutonic Complex, which contain isolated pendants of quartz-rich 'Yukon Group' metamorphic rocks.

Current Work and Results:

The 1981 program consisted of reconnaissance and detailed geological mapping and geochemical sampling. During the program, 21 heavy mineral, 20 stream sediment, 175 soil and 116 rock samples were collected and analyzed for Au, Ag, Pb, Cu, Zn, As, Mo, Sb, Sn and W. Soil, stream sediment or heavy minerals were considered anomalous if they contained greater than 35 ppb Au, 4 ppm Ag, 250 ppm Pb, 185 ppm Cu, 420 ppm Zn, 50 ppm As, 9 ppm Mo, 40 ppm Sb, 5 ppm Sn or 6 ppm W. Pb, Ag and Au results generally related to known showings.

Mineralization consists of a swarm of veins containing galena, stibnite, chalcopyrite, malachite, azurite, sphalerite, arsenopyrite, pyrite, scorodite, jarosite and pyrrhotite. Most veins are 0.1 to 5.0 m in width and are found within felsic ash flow lapilli tuffs of the McCauley Creek Formation. Argillic alteration and bleaching of country rocks occurs on either side of the veining. Seven showings have been located to date. Chip sample assays of 2.2% Cu, 1.7% Pb, 0.44% Zn, 654.9 g Ag/t, trace Au over 30 m, and 1.54% Cu, 7.23% Pb, 1.48% Zn, 5.45 g Au/t and 573.4 g Ag/t over 1.2 m were reported.

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GAMMON
AGIP Canada Limited

Geochemical Target
105 D 16 (96)
(60°53'N,134°14'W)

Claims: GAMMON (88)

Current Work and Results:

Stream sediment and geochemical anomalies were determined in several streams draining granitic intrusives, Mesozoic sedimentary rocks and some Tertiary volcanic rocks. No work was carried out on the original GAMMON 1-6 claims in 1981, but the additional claims were staked in November, 1981.

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KUKU
AGIP Canada Limited

105 D 3 (115)
(60°12'N,135°25'W)

Claims: KUKU 1-331; CHIEF 1-71

Current Work and Results:

These claims cover gossan and alteration zones in Skukum Group volcanic rocks. The claims were partially mapped at a scale of 1:10,000 and detailed soil sampling was conducted on 48 of the claims in 1981. Some stream sediment and rock chip samples were also collected. Five line km of magnetometer survey and four hand trenches to a total length of 94 m were completed. Several anomalous zones were outlined.

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1981 MINERAL CLAIMS STAKED

JUBILEE
H & D Holdings

105 D 1 (1)
(60°13'N,134°07'W)

Claims 1981: JM (44)

VENUS
United Keno Hill Mines Limited

105 D 2 (5)
(60°02'N,134°05'W)

Claims 1981: ZYX (2)

ATHES
P. Campbell et al

105 D 2 (108)
(60°03'N,134°14'W)

Claims 1981: ATHES (24)

DUNK
D. Duncan et al

105 D 2 (109)
(60°02'N,134°19'W)

Claims 1981: DUNK (20)

UNDAL — 105 D 2 (110)
J. Tomlinson et al — (60°04'N,134°19'W)

Claims 1981: UNDAL (24)

CARCROSS — 105 D 2 (10)
S. Szollosi et al — (60°09'N,134°42'W)

Claims 1981: DOMA (4)

TROLL — 105 D 2 (111)
J. Hajek — (60°05'N,134°28'W)

Claims 1981: TROLL (6)

CROMWELL, MILLHAVEN — 105 D 2 (33,34)
F. Steele et al — (60°06'N,134°58'W)

Claims 1981: BIGHORN (48)

BUFFALO — 105 D 3 (31)
E. Nelson — (60°13'N,135°01'W)

Claims 1981: CARIBOU (24)

ODD — 105 D 3 (112)
P. Heynen et al — (60°11'N,135°01'W)

Claims 1981: ODD (20); EVEN (16)

MT. ANDERSON — 105 D 3 (28)
W. Hyde et al — (60°12'N,135°08'W)

Claims 1981: TYCON (16)

BACHUS — 105 D 3 (113)
Valour Ventures Limited — (60°09'N,135°13'W)

Claims 1981: BACHUS (8); BELL (6)

SHAW — 105 D 3 (72)
Kennco Exploration Limited — (60°01'N,135°20'W)

Claims 1981: GOAT (16)

NIAD — 105 D 3 (114)
Archer, Cathro and Associates Limited — (60°01'N,135°27'W)

Claims 1981: NIAD (16)

MORNING — 105 D 3 (23)
M. Johnson et al — (60°12'N,135°22'W)

Claims 1981: CHIEF (71)

KUKU — 105 D 3, 4 (115)
AGIP Canada Limited — (60°13'N,135°28'W)

Claims 1981: KUKU (331)

RAM — 105 D 4 (105)
Canadian Nickel Company — (60°12'N,135°44'W)

Claims 1981: RAM (14)

PRIMROSE — 105 D 5 (16)
F. Nelson et al — (60°16'N,135°58'W)

Claims 1981: DALL (24)

DAYIR — 105 D 6 (116)
J. McCrory et al — (60°29'N,135°25'W)

Claims 1981: DAYIR (18)

EVIEW — 105 D 6 (117)
J. McCrory et al — (60°27'N,135°03'W)

Claims 1981: EVIEW (16)

DONKEY — 105 D 6 (76)
W. Eng et al — (60°18'N,135°03'W)

Claims 1981: OLLIE (25)

ALBATROS — 105 D 6 (122)
G. Reynolds — (60°18'N,135°08'W)

Claims 1981: RM (5); ALBATROS; BLUEBIRD

TIKA — 105 D 7 (118)
R. Craft — (60°18'N,134°26'W)

Claims 1981: TIKA (4)

ILLIA — 105 D 7 (119)
T. McCrory — (60°16'N,134°25'W)

Claims 1981: ILLIA (30)

AMN — 105 D 7 (120)
E. Nelson — (60°26'N,134°22'W)

Claims 1981: AMN (2)

MARSH — 105 D 8 (63)
G. McLeod — (60°22'N,134°11'W)

Claims 1981: MF (4); FM (3)

ICHIE
B. Preston et al
105 D 9 (121)
(60°36'N,134°07'W)

Claims 1981: ICHIE (28)

TONY
D. Greig et al
105 D 9 (89)
(60°37'N,134°20'W)

Claims 1981: INTO (32)

BEXI
D. Duncan et al
105 D 11 (123)
(60°30'N,135°22'W)

Claims 1981: BEXI (16)

FLAT
T. McCrory et al
105 D 14 (124)
(60°59'N,135°26'W)

Claims 1981: FLAT (24)

CUTOFF
B. Preston
105 D 14 (45)
(60°55'N,135°13'W)

Claims 1981: SCOT (12)

LABE
J. Quinsey et al
105 D 15 (102)
(60°56'N,134°58'W)

Claims 1981: LABE (32)

ERGE
T. McCrory et al
105 D 15 (125)
(60°52'N,134°55'W)

Claims 1981: ERGE (30)

ACE
Valour Ventures Limited
105 D 15 (48)
(60°55'N,134°42'W)

Claims 1981: JOE (28)

UNCER
K. Smith et al
105 D 15 (126)
(60°54'N,134°41'W)

Claims 1981: UNCER (120)

SLEWE
D. Greig et al
105 D 15 (127)
(60°48'N,134°43'W)

Claims 1981: SLEWE (20)

UTSHIG
D. Greig et al
105 D 16 (128)
(60°54'N,134°26'W)

Claims 1981: UTSHIG (48)

GAMMON
AGIP Canada Limited
105 D 16 (96)
(60°52'N,134°13'W)

Claims 1981: GAMMON (82)

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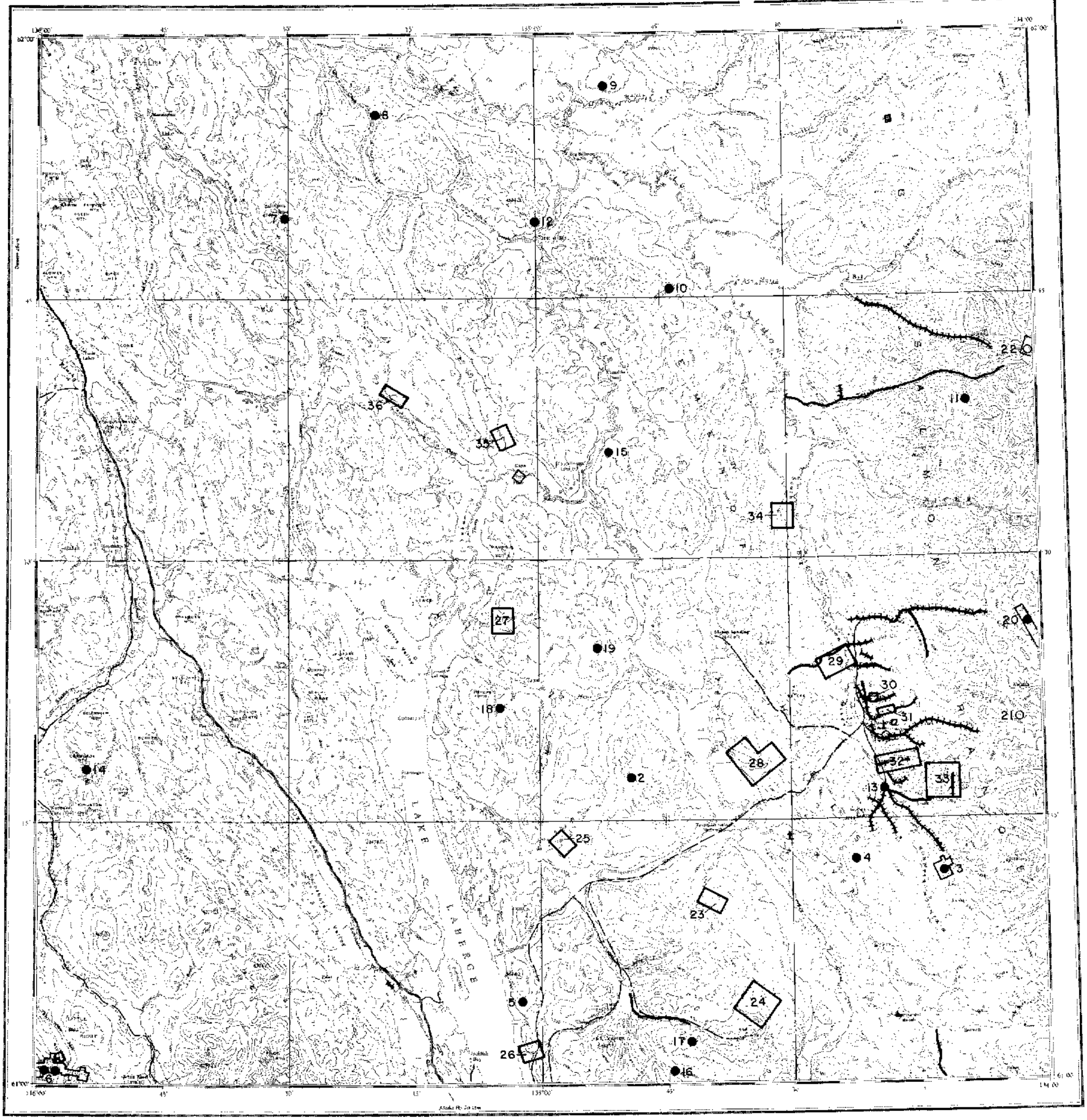
105E



LABERGE

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.... Mineral Claims staked in 1981

.... Prospecting Leases in good standing (April 1982)

.... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

LABERGE MAP-AREA (NTS 105 E)

General Reference: GSC Open File 578 by: D.J. Tempelman-Kluit, 1978.

NO.	PROPERTY NAME	REFERENCE
1	FLOAT	Gold-Silver-Copper-Lead Vein
2	TUV	Copper-Molybdenum Porphyry
3	LOON	Craig & Laporte (1972, p. 119-120)
4	BEE	Copper Occurrence
5	LABERGE	Findlay (1969a, p. 55-56)
6	TAKHINI	Skarn Copper
7	PACKERS	Skarn Copper-Iron
8	CLAIRE	Bostock & Lees (1938, p. 16)
9	WALSH	Bostock & Lees (1938, p. 16)
10	SEMENOF	Copper-Gold-Silver Vein
11	ILLUSION	D.I.A.N.D., Mines and Minerals Activities, 1971, p. 19
12	CASSIAR BAR	Copper-Silver Occurrence
13	SYLVIA	Lead-Zinc-Gold-Silver-Copper Vein
14	CORDUROY	Coal
15	HOOTALINQUA	Coal
16	HIG	D.I.A.N.D. (1981, p. 170)
17	LORI	Molybdenum-Copper Porphyry
18	MUSTARD	Gold Vein
19	BACON	Copper-Molybdenum Porphyry
20	HAL	D.I.A.N.D. (1981, p. 170)
21	YETI	D.I.A.N.D. (1981, p. 170)
22	FOG MOUNTAIN	This Report
23	CROST	This Report
24	SLINE	This Report
25	AURIER	This Report
26	AKEL	This Report
27	OVOAS	This Report
28	ENOF	This Report
29	GERM	This Report
30	REN	This Report
31	NC	This Report
32	MARBEE	This Report
33	MAYBE	This Report
34	SBS	This Report
35	HOOT	This Report
36	RANKL	This Report

<u>FOG MOUNTAIN</u> — Zinc, Lead Skarn
Amoco Canada Petroleum Company Limited — 105 E 9, 105 F 12 (22)
(61°42'N,134°00'W)

Claims: FOG MOUNTAIN 1-20

Source: Summary by P. Watson from assessment report 090804 by P. Brown.

History:

The claims were staked in August, 1980, as a result of a reconnaissance stream sediment and prospecting program carried out earlier in that season.

Description:

Interbedded, medium - grained, quartz-muscovite schist and recrystallized argillaceous limestone underlie the property and have been cut by a felsic dyke. Silicified, epidotized and chloritized limestone units host skarn-like pods and lenses of lead-zinc mineralization with erratic grades.

Current Work and Results:

A total of 297 soil samples were collected in 1980 on a grid of 51 m sample intervals along 200 m spaced lines, and analyzed for Mo, Cu, Pb and Zn. Tungsten was analyzed for in every third sample (95 samples), and an additional 108 samples containing anomalous lead and zinc were also analyzed for gold, silver and tungsten.

Two anomalous areas of greater than 200 ppm lead and 200 ppm zinc were delineated. The anomalies for both elements were coincident, but zinc anomalies were more extensive. The western anomaly extends for 900 m by 1,000 m, while the eastern anomaly is 550 m by 700 m in areal extent. Since these are separated by a steep, erosional valley, it is probable that both anomalies are directly related to the mineralized limestone.

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<u>1981 MINERAL CLAIMS STAKED</u>

SLINE — 105 E 2 (24)
T. McCrory <u>et al</u> — (61°04'N,134°05'W)

Claims 1981: SLINE (64)

CROST — 105 E 2 (23)
K. Smith <u>et al</u> — (61°10'N,134°10'W)

Claims 1981: CROST (24)

AURIER — 105 E 2 (25)
J. McCrory <u>et al</u> — (61°14'N,134°27'W)

Claims 1981: AURIER (20)

AKEL — 105 E 3 (26)
W. Eng <u>et al</u> — (61°02'N,135°01'W)

Claims 1981: AKEL (20)

OVOAS — 105 E 6 (27)
T. McCrory <u>et al</u> — (61°26'N,135°05'W)

Claims 1981: OVOAS (32)

ENOF 105 E 7 (28)
B. Preston et al (61°18'N,134°04'W)

Claims 1981: ENOF (80)

GERM 105 E 8 (29)
A. Andronik et al (61°24'N,134°25'W)

Claims 1981: GERM (40)

REN 105 E 8 (30)
R. Fendrick (61°21'N,134°20'W)

Claims 1981: REN (4)

NC 105 E 8 (31)
G. Asuchak (61°21'N,134°18'W)

Claims 1981: NC (8)

MARBEE 105 E 8 (32)
D. Duncan et al (61°18'N,134°17'W)

Claims 1981: MARBEE (40)

MAYBE 105 E 8 (33)
K. Mickelson et al (61°17'N,134°12'W)

Claims 1981: MAYBE (64)

SBS 105 E 10 (34)
B. Preston et al (61°32'N,134°30'W)

Claims 1981: SBS (30)

HOOT 105 E 11 (35)
M. Menelon et al (61°37'N,135°04'W)

Claims 1981: HOOT (20)

RANKL 105 E 11 (36)
P. Heynen et al (61°39'N,135°17'W)

Claims 1981: RANKL (18)

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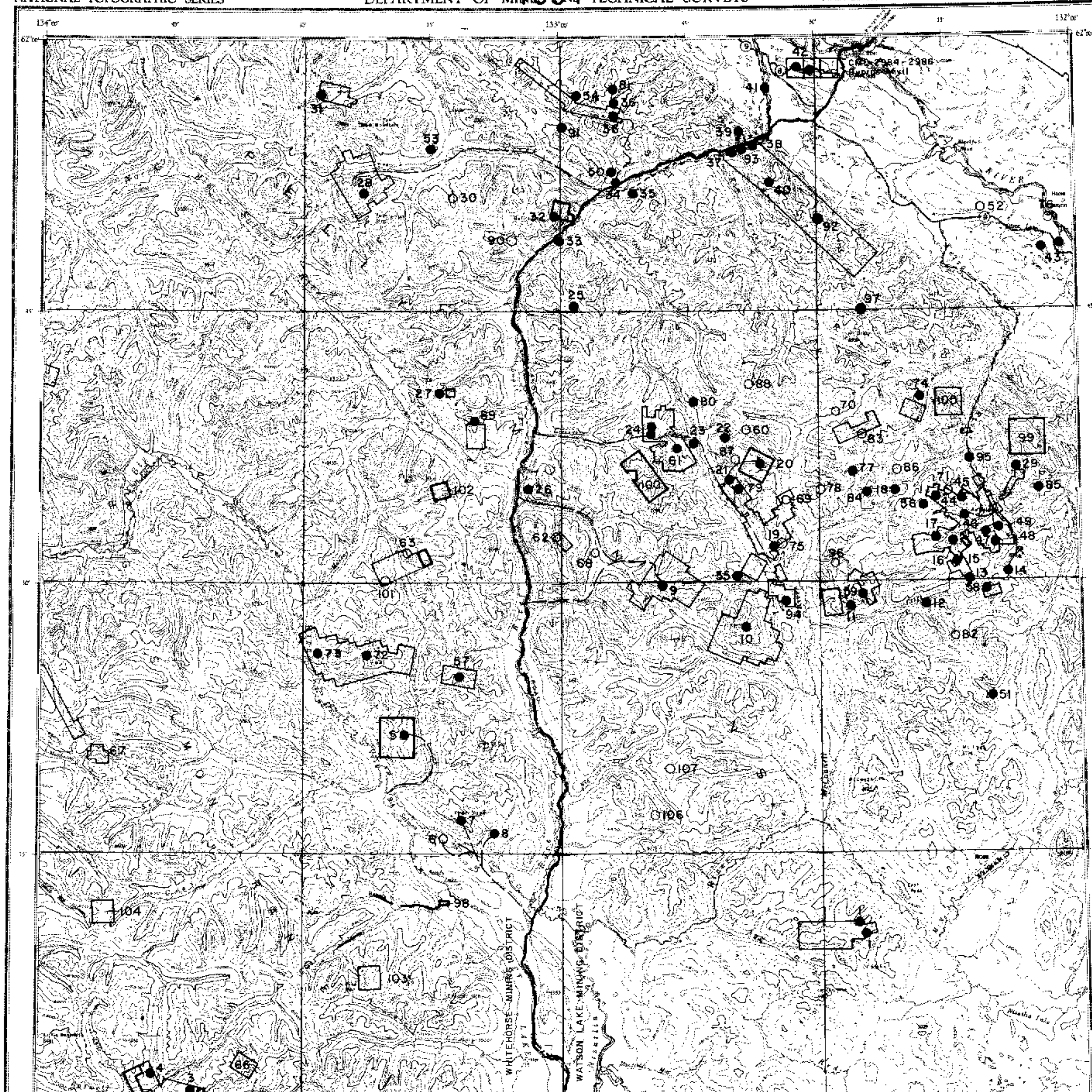
105 F

NATIONAL TOPOGRAPHIC SERIES — DEPARTMENT OF MINES AND TECHNICAL SURVEYS — FIRST EDITION — CANADA SHEET 105 F



QUIET LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.... Mineral Claims staked in 1981

.... Prospecting Leases in good standing (April 1982)

.... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

QUIET LAKE MAP-AREA (NTS 105 F)

General Reference: GSC Open File 486 by: D.J. Tempelman-Kluit, 1977.

NO.	PROPERTY NAME	REFERENCE
1	MOLLY	This Report
2	MOBS	Green (1966, p. 60-62)
3	WOPUS	D.I.A.N.D. (1981, p. 177); This Report
4	GOPHER	Green (1966, p. 60-62); This Report
5	IOLA	This Report
6	VODKA	Asbestos
7	TOWER PEAK	This Report
8	DODY	Asbestos
9	STORMY	D.I.A.N.D. (1981, p. 173)
10	MM	Morin et al (1977, p. 83-97)
11	CPA	Morin et al (1979, p. 80-81)
12	SONNY	Silver-Lead Vein
13	KAY	Findlay (1969a, p. 76-77)
14	SHARON	Findlay (1969a, p. 76-77)
15	OXO	Green (1965, p. 42-43)
16	KOPINEC	Copper Vein; This Report
17	BOOM	This Report
18	OPERATION	Copper Occurrence
19	BOX	D.I.A.N.D. (1981, p. 173)
20	GRAYLING	This Report
21	COXALL	Copper Vein
22	TYRO	Zinc-Silver-Copper-Lead Vein
23	HAYDN	Silver-Lead-Copper-Zinc-Gold Vein
24	GROUNDHOG	Findlay (1969b, p. 46-47)
25	ROCKY	Asbestos
26	PONY	Kindle (1945, p. 24)
27	HAM	Skarn Tungsten
28	RISBY	This Report
29	AMBROSE	Copper-Silver Vein
30	TUB	Lead-Zinc-Copper-Tungsten Occurrence
31	EVA	D.I.A.N.D. (1981, p. 173)
32	BARITE MOUNTAIN	Green & Godwin (1964, p. 40-41); This Report
33	McNEE	Kindle (1945, p. 24)
34	CANUSA	Lead-Silver-Gold Vein
35	CYR	Wheeler et al (1960)
36	MT. COOK	This Report
37	LAPIE	Kindle (1945, p. 25)
38	WATERFALL	Kindle (1945, p. 25)
39	DANGER	Kindle (1945, p. 25)
40	MT. ROSS	Kindle (1945, p. 25)
41	TRENCH	Kindle (1945, p. 21)
42	WHISKY LAKE	Findlay (1967, p. 89)
43	BRUCE LAKE	Green & Godwin (1964, p. 42-43)
44	MT. MISERY	Silver-Lead-Copper Vein
45	KEY 3	Green (1966, p. 64-68); Findlay (1969b, p. 44-46)
46	LAP 10	Findlay (1969, p. 44-46)
47	HOEY	Findlay (1969, p. 44-46)
48	STUMP	Findlay (1969, p. 44-46)
49	KETZA RIVER	D.I.A.N.D. (1981, p. 174)
50	MAGUNDY	Silver-Lead Vein
51	HOGG	Copper Vein
52	CHUNG	
53	ASKIN	Barite Stratabound
54	DIRK	Barite Stratabound
55	CONNELL	
56	FURY	
57	OBVIOUS	This Report
58	NOKLUIT	D.I.A.N.D. (1981, p. 175)
59	GUANO	D.I.A.N.D. (1981, p. 55-59, 175)
60	TAKU	D.I.A.N.D. (1981, p. 175)
61	H	D.I.A.N.D. (1981, p. 175)
62	FIRST	D.I.A.N.D. (1981, p. 176)
63	LAST	D.I.A.N.D. (1981, p. 176)
64	BR	This Report
65	MMM	This Report
66	TIM	This Report
67	RPP	This Report
68	ADDY	D.I.A.N.D. (1981, p. 177)
69	JDX	D.I.A.N.D. (1981, p. 177)
70	McCASH	D.I.A.N.D. (1981, p. 177)
71	TOOTS	D.I.A.N.D. (1981, p. 177)
72	HIDDEN	This Report
73	AYDUCK	This Report
74	CLO	D.I.A.N.D. (1981, p. 176)
75	GULL	Sinclair et al (1976, p. 162)
76	HOOLEO	Sinclair et al (1976, p. 162)
77	CHZERPNOUGH	Morin et al (1979, p. 81)
78	BNOB	Morin et al (1979, p. 83)
79	SUN	Morin et al (1977, p. 195)
80	ANISE	Morin et al (1979, p. 83)
81	WIMP	Morin et al (1979, p. 62)
82	MUMS	Morin et al (1979, p. 80)
83	TREE	Morin et al (1980, p. 61)
84	DROC	Morin et al (1979, p. 81)
85	HOWRU	Morin et al (1980, p. 62)
86	EROS	Morin et al (1979, p. 82)
87	NOT	Morin et al (1979, p. 82)
88	RAM	Morin et al (1980, p. 62)
89	LAD	Morin et al (1980, p. 37)
90	PIM	Morin et al (1980, p. 37)
91	GK	Morin et al (1980, p. 38)
92	ANGIE	Morin et al (1980, p. 38)
93	BOB	Morin et al (1980, p. 39)
94	GRAY	Morin et al (1980, p. 60)
95	IGLE	Morin et al (1980, p. 61)
96	SEATU	Morin et al (1980, p. 62)
97	TOM	Morin et al (1980, p. 63)
98	FER	This Report
99	NCC	This Report
100	LORNE	This Report
101	MOX	This Report
102	SNERD	This Report
103	PISA	This Report
104	SAL	This Report
105	TIER	This Report
106	OXY	This Report
107	BIG OX	This Report

MOLLY
Canadian Occidental
Petroleum Limited

Molybdenum, Tungsten
Skarn
105 F 1, 2 (1)
(61°10'N,132°30'W)

References: Green and Godwin (1964, p. 45-46); GSC Open File Report 564; D.I.A.N.D. (1981, p. 173); Morin et al (1977, p. 190)

Claims: WOX 1-72; NISU 1-16

Source: Summary by P. Watson from assessment report 090630 by E.J. Sacks, and assessment reports 090837 and 090838 by C.J. Richardson.

History:

The WOX claims were staked in 1979 to cover a multi-site GSC-URP stream sediment uranium-molybdenum-tungsten anomaly adjacent to a known molybdenum-tungsten skarn occurrence (MOLLY). In 1980, the NISU claims were staked on the east side of the WOX claims to cover a lapsed section of the MOLLY. The original MOLLY showing was staked by Conwest Explorations Limited in 1962 and later drilled, and has been examined for molybdenum potential numerous times since that date.

Description:

The area is underlain by northeasterly trending, southeasterly dipping Silurian calc-silicate hornfels, quartzite and limestone which were intruded and metamorphosed by Cretaceous, porphyritic biotite quartz monzonite of the Nisutlin Batholith. Carboniferous to Permian greenstone has been thrust over the assemblage from the southwest. Mineralized (molybdenum-zinc-uranium) shear zones are present throughout the property, cutting the quartz monzonite. The basal section of the metsedimentary rocks contains small skarns and skarn bands, with minor tungsten-molybdenum mineralization in the calc-silicate hornfels, developed as a result of the intrusion. The MOLLY showing consists of visible molybdenite and scheelite at the quartz monzonite-skarn contact, over 10 m by 2 m. The best intersection of 1963 drilling was 1.08% MoS_2 over 4.05 m.

Current Work and Results:

Geological, geochemical and radiometric surveys were carried out in 1979 and 1980. In 1979, 10 rock, 2 heavy mineral, 32 stream sediment, 29 stream water and 16 soil samples were collected and analyzed for up to 9 elements. Samples of muscovite-bearing quartz monzonite contained anomalous uranium, molybdenum and tungsten. Several stream sediment and soil anomalies were located.

In 1980, 57 rock, 7 heavy mineral, 24 stream sediment, 24 stream water and 470 soil samples were collected. The MOLLY showing was found to occur within a thin pendant of metasedimentary rocks with no potential for significant tonnage. Other occurrences of metasedimentary rock-intrusive rock contact mineralization were found in the quartz monzonite and in smaller skarn bands, but these were also very small and localized. Strong molybdenum-tungsten soil, stream sediment and heavy mineral anomalies appear to correlate with known mineralization or with metasedimentary rock-intrusive rock contacts. Rock geochemistry shows minor enrichment of molybdenum, tungsten, zinc and uranium in altered shear zones in the quartz monzonite.

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IOLA
AGIP Canada Limited

Geochemical Target
105 F 6 (5)
(61°22'N,133°20'W)

Claims: BARB (72)

Current Work and Results:

In 1981, the limited outcrop exposure was mapped at a scale of 1:10,000, soil samples were collected from the eastern half of the property, and creeks draining the claims were sampled at 200 m intervals. Anomalous base metal values were found in soil and stream sediment samples.

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TOWER PEAK
B.A. Copper Mines Limited

Copper, Asbestos
105 F 6 (7)
(61°17'N,133°12'W)

Reference: Hamilton (1965).

Claims: TOWER 1-24, 26-40

Source: Summary by P. Watson from assessment report 091007 by J.B.P. Sawyer.

History:

Initial exploration was carried out in this area in the 1950's and 1960's, mainly to evaluate the asbestos potential of the area. Numerous claim blocks were located in the general area, including REX, ACME and TROUT just to the north of the present claim block. The TOWER claims were staked in 1979 and enclose the JIM DANDY 1 and 2 claims.

The property is located approximately 10 km west of the Canol Road and is connected to it by a four-wheel drive road to the southeast end of Big Salmon Lake and to the claims.

Description:

Two distinct terranes are exposed on the property, separated by a northwest-trending thrust plane. The southern third of the property is underlain by Silurian and Lower Devonian sedimentary rocks of the Nasina facies (slates and graphitic siltstones), while the northern two-thirds is underlain by rocks of the Anvil-Campbell Allochthon. These include amphibolite, greenstone, altered basalt, dunite, peridotite, pyroxenite and serpentinized equivalents.

Current Work and Results:

The 1981 preliminary examination program included line cutting, geological mapping and soil geochemical sampling.

A total of 4.2 km of baseline were cut and 31.8 km chained and flagged. The area was mapped at a scale of 1:4,000, and 19 chip channel rock samples were collected. These were analyzed for Au, Ag and Cu. The 274 soil samples collected were analyzed for Cu, Pb and Zn. Thresholds of 77 ppm Cu, 39 ppm Pb and 279 ppm Zn were calculated. An anomalous copper zone was coincident with a broader Zn anomaly. No lead values were anomalous, but the higher values obtained also coincided with the anomalous copper zone.

Three types of mineralization are found on the property. The first of these is a showing of non-commercial, low-quality asbestos fibres found in highly serpentinized mafic to ultramafic rock on the JIM DANDY #1 claim.

The second type of mineralization is a small chalcocite veinlet with surrounding malachite staining found in green volcanic rock. This is found in an area of old trenching and several chip channel samples were collected in the area. One returned values of 1.1 ppm Ag and 2.5% Cu over 20 m, but most contained insignificant Au and Ag and only minor Cu.

The third area of interest is a zone of late stage quartz veining and silicification. This extends over a width of 3.5 m and the quartz veining contains weakly disseminated pyrite, chalcopyrite and rare galena, but negligible gold and silver.

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BOOM
Ketza River Mines Limited

Gold
105 F 9 (17)
(61°32'N,132°15'W)

Reference: Skinner (1961, p. 39); Morin (1981, in D.I.A.N.D. 1981, p. 76-77).

Claims: KON 1-22

Source: Summary by P. Watson from assessment report 090953 by M. Zurowski.

History:

The KON claims surround an area of 29 mining leases owned by Ketza River Mines Limited. Gold mineralization on the leases was first discovered by Conwest in 1954. From 1955 to 1960, the leased area was explored by trenching and approximately 3,042 m of diamond drilling. Two gold-bearing deposits were outlined and designated as PEEL 3c and PEEL 3. The PEEL 3c deposit has a length of 76 m and a width of 7.6 m. It is steeply north dipping and occurs in shale and limestone. The PEEL 3 deposit is the larger of the two deposits and measures 305 m long by 76 m wide with an average thickness of 4.6 m. The deposit is an oxidized and leached sulphide replacement zone consisting of irregularly-shaped sulphide bodies interspersed with large remnants of limestone in a 150 m thick bed of Lower Cambrian limestone. The mineralization consists of nearly horizontally-bedded pyrrhotite, gold-bearing arsenopyrite, pyrite and minor chalcopyrite. Both the PEEL 3c and the PEEL 3 are open for extension. Access to the property is by four-wheel drive road from Ross River.

Current Work and Results:

The 1981 program consisted mainly of soil geochemistry. Fifty-eight samples were collected on lines parallel to strike and analyzed for Pb, Zn, Au, Ag and As. Anomalous values are found in areas containing gold -bearing float and near a gold occurrence drilled in 1958. Two types of gold mineralization were noted: one in massive sulphides along fault zones as replacement and fracture fillings in the Cambrian dolomite, and the other with pyrrhotite associated with ankeritic carbonate veins.

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GRAYLING
Great Western Petroleum Corporation

Lead, Silver, Zinc
105 F 10 (20)
(61°38'N,132°39'W)

References: Morin et al (1977, p. 83, 96); Green and Godwin (1964, p. 41-42; GSC Open File Report 564.

Claims: NEX 1-36

Source: Summary by P. Watson from assessment report 090978 by L.K. Eccles.

History:

The NEX claims were staked on behalf of Seagull Joint Venture in April, 1981 to cover anomalous Ba, Pb, Zn and Ag values reported in GSC Open File Report 564. At one time the area was covered by the following claims: CONE, ALICE, DEMPY, COOT, PV, CC, AP, JACK, JEFF, JP and DELLA. Only trenching assessment has been recorded on any of these claims. COOT 1 and 2 are still in good standing, and an old campsite, drill core and some trenching are located on these claims. Access to the NEX claims is by 27 km of bush roads through Groundhog and Seagull Creeks from a point on the Canol Road 75 km south of Ross River.

Description:

Four units have been mapped on the property. The oldest of these consists of thick-bedded dolomites of Silurian to Devonian age which have been thrust onto a package of siliceous slate and shale, thin-bedded cherts and greywackes. Breccias, tuffs and volcanic flows of the third unit have mineralization associated with them. The fourth unit is a hornblende syenite intrusive.

The main mineralization is peripheral to the syenite plug and consists of boulders of massive sulphide (Pb, Ag, Zn, Cu) float. In some cases this was banded and appeared to be stratiform, while elsewhere it appeared to have been remobilized into veins. Galena, sphalerite, chalcopyrite and arsenopyrite were found associated with interbedded volcanics and limy sedimentary rocks.

Current Work and Results:

Geochemical sampling was undertaken on the property in 1981 with 42 stream sediment, 42 soil and 11 rock samples analyzed for Cu, Pb, Zn, Ag, Au and W. Values greater than 20 ppb Au, 64 ppm Cu and 20 ppm W were considered anomalous for both soils and stream sediments. Anomalous values for silver were greater than 1.2 ppm for soil and 1.6 ppm for stream sediment. Soils containing greater than 592 ppm Zn or 328 ppm Pb were considered anomalous, as were stream sediments containing greater than 964 ppm Zn or 384 ppm Pb.

Silver values were highest over volcanic and volcano-sedimentary rocks, while high Pb and Zn values followed high Ag. Au, Cu and W were generally low.

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RISBY
Hudson Bay Exploration and Development Company Limited

Tungsten Skarn
105 F 14 (28)
(61°52'N,133°22'W)

References: Craig and Laporte (1972, p. 125-126); Morin et al (1980, p. 37-38).

Claims: CAB 1-23

Source: Summary by P. Watson from assessment report 090824 by G.E. Bidwell and assessment report 091005 by D.A. Downing.

History:

The CAB claims were staked in 1968 by P. Risby, and optioned to Atlas Explorations Limited, who conducted geological and geochemical surveys in 1969-70. In 1971, the claims were registered in the name of Risby Tungsten Mines Limited and 1,086 m of diamond drilling was completed. Trenching was done in 1977 and 1978. In 1979, Hudson Bay Exploration and Development Company Limited carried out 1,625.8 m of diamond drilling.

Current Work and Results:

In 1980, 2,162 m were drilled in 14 holes, and in 1981, 2,183 m were drilled in nine NQ holes on the Number 2 Zone, testing out a strike length of 1,200 m and a maximum vertical depth of 350 m. The skarn horizon hosting the scheelite was found to persist in the area drilled, although with greatly reduced width to the northwest. Pyrrhotite content increases downdip in the mineralized horizons, accompanied by an increase in alteration in the biotite schist, and an increase in the amount of quartz veining. A third skarn horizon may be present to the southeast. Grades of 0.67% WO_3 over 18.12 m and 0.49% WO_3 over 18.08 m were reported for two of the holes.

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MT. COOK
Amax of Canada Limited

Zinc, Molybdenum
105 F 15 (36)
(61°56'N,132°55'W)

Reference: Morin et al (1980, p. 39).

Claims: GREW 1-28

Source: Summary by P. Watson from assessment report 090883 by F.R. Harris.

History:

The area was staked in 1966 by Atlas Exploration, and some bulldozer trenching was completed. The GREW claims were staked by Amax of Canada Limited in 1977, and geological, geochemical and EM surveys were undertaken in 1977 and 1978.

Current Work and Results:

During 1981, geological and geochemical surveys were conducted. Three types of mineralization have been found: a narrow sphalerite shear zone in the volcanic rocks; disseminated pyrrhotite with traces of chalcopyrite in the volcanic rocks; and minor molybdenite associated with a quartz monzonite plug.

A total of 370 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples containing greater than 100 ppm Cu, 40 ppm Pb, 250 ppm Zn or 1.0 ppm Ag were considered anomalous. Most soil anomalies were located over volcanic rocks, and shales just north of the volcanic rocks.

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OBVIOUS
Cub Joint Venture

Tungsten Skarn
105 F 6 (57)
(61°24'N,133°15'W)

Reference: D.I.A.N.D. (1981, p. 174).

Claims: OBVIOUS (32)

Current Work and Results:

Four claims were mapped at a scale of 1:2,000 in 1981. Two claims were covered by 100 m by 50 m soil geochemical, EM-16 and proton magnetometer surveys.

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B.R.
Amoco Canada Petroleum Company Limited

Geochemical Target
105 F 3 (64)
(61°01'N,133°27'W)

Claims: B.R. 1-16

Source: Summary by P. Watson from assessment report 090870 by P. Brown.

History:

The B.R. claim group was staked in September, 1980 to cover a soil anomaly generated from a follow-up reconnaissance soil sampling program conducted around a molybdenum anomaly located in the 1980 reconnaissance silt sampling survey.

Description:

The claims are underlain by coarse-grained granodiorite to monzonite of the Cretaceous Quiet Lake Batholith, which has intruded Yukon Group schists and gneisses. The intrusion is moderately well-fractured, with pyrite along some fracture planes and is cut by alaskite dykes. No molybdenum mineralization or quartz stockwork was found associated with the dykes. However, several specks of molybdenum mineralization were found with pyrite on fracture planes in the monzonite, and disseminated scheelite was found in the intrusion.

Current Work and Results:

During 1981, 190 soil samples were collected at 50 m intervals and analyzed for Mo, Cu, Pb, Zn and W. A weak to moderate Mo anomaly of greater than 35 ppm Mo (background 2 ppm Mo) extends 700 m by 600 m. A smaller W anomaly coincides with the northern part of the Mo zone. The Cu anomaly is also directly related to Mo values, with two weakly anomalous zones over 100 ppm Cu (background 15 ppm Cu).

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MMM
AMOCO Canada Petroleum Company Limited

Geochemical Target
105 F 4,
105 C 13 (65)
(61°00'N,133°34'W)

Claims: MMM 1-20

Source: Summary by P. Watson from assessment report 090806 by P Brown.

Description:

The property was staked in August, 1980 to cover reconnaissance stream sediment anomalies. It is underlain by biotite-rich monzonite to granodiorite of the Quiet Lake Batholith, which contains disseminated pyrite. Gossans are abundant in the northern part of the claim block.

Current Work and Results:

The property was grid soil sampled in 1980 and 216 samples analyzed for Mo, Cu, Pb and Zn. Every third sample (64 samples) was also analyzed for W. A moderate molybdenum anomaly in the northern part of the claims extended 1,200 m by 400 m, and was open to the east. Molybdenum values range from 20-54 ppm Mo.

The soil anomalies are believed to be related to underlying gossanous bedrock.

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TIM
AMOCO Canada Petroleum Company Limited

Geochemical Target
105 F 4 (66)
(61°04'N,133°36'W)

Claims: TIM 1-20

Source: Summary by P. Watson from assessment report 090805 by P Brown.

Description:

TIM 1-20 were staked in August, 1980, to cover reconnaissance stream sediment sample sites anomalous in molybdenum. They are underlain by biotite-rich monzonite to granodiorite of the Quiet Lake Batholith, which, in the south and west, contains rafted blocks and inclusions of quartz biotite schist.

Current Work and Results:

The property was grid soil sampled in 1980 and the 216 samples collected were analyzed for Mo, Cu, Pb and Zn. Every third sample (72 samples) was also analyzed for W.

A weak-to-moderate molybdenum anomaly (39-98 ppm Mo) extends for 1,000 m by 50 to 300 m. This is believed to be associated with pyrite in quartz mica schist and biotite-rich granodiorite at the base of a northeast-trending cliff.

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RPP
AGIP Canada Limited

Geochemical Target
105 F 5 (67)
(61°21'N,133°54'W)

Reference: GSC Open File Report 564.

Claims: RPP 1-19

Source: Summary by P. Watson from assessment report 090856 by R.C.R. Robertson and P.D. Van Angeren.

Description:

The RPP claims were staked in 1980 during follow-up to the release of GSC Open File Report 564.

Current Work and Results:

In 1980, following the staking of the RPP group, preliminary geological and geophysical surveys were carried out on part of the property.

In 1981, soil sampling and some rock sampling were carried out. The geochemical response was generally poor, possibly because of extensive coverage by outwash and talus.

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HIDDEN, AYDUCK
Cub Joint Venture

Tungsten Skarn
105 F 6 (72,73)
(61°26'N,133°22'W)

Claims: HIDDEN 1-178; AYDUCK 1-24

Source: Summary by P. Watson from assessment report 090961 by J.G. Abbott.

History:

The claims were staked in 1978 and 1979 by Cub Joint Venture (Cassiar Asbestos Corporation Limited [now Brinco Mining Ltd.], Highland-Crow Resources Ltd. and Union Carbide Canada Limited, managed by Archer, Cathro & Associates Ltd.) to cover two tungsten occurrences. The 1978 program included limited mapping, soil panning, geochemistry, and hand trenching.

Description:

The tungsten showings occur in Middle Paleozoic carbonate, shale and quartzite along the southwest margin of the Nisutlin Batholith. These sedimentary rocks belong to the Nasina and "Black Clastic" facies and form an alternating sequence of carbonate and clastic rocks over 1,200 m thick that have been tentatively subdivided into six map units. Massive white dolomite is overlain by up to 200 m of recessive black, graphitic, calcareous slate and minor grey fetid limestone. The HIDDEN showing occurs in the limestone at the top of this unit. The rocks grade into over 500 m of silty shale interbedded with graphitic shale and thinly laminated silty dolomite. This in turn is overlain by recessive, rusty weathering, non-calcareous slate. Up to 300 m of sandy dolomite with lenses of massive quartz contain the AYDUCK showing near the top and are overlain by at least 300 m of graphitic, non-calcareous siliceous slate. Porphyritic granodiorite or quartz monzonite of the Nisutlin Batholith underlies the northern margins of the property, and two feldspar porphyry dykes up to 10 m wide are exposed near the HIDDEN showing.

Work done in 1978 indicates that the AYDUCK zone is flat-lying, 2.5 m thick and at least 700 m long. Grades of 0.5% WO_3 were reported over this width.

Current Work and Results:

In 1979, the property was mapped at 1:5,000 or 1:2,000 scales, soil panning and geochemical surveys were conducted over the entire batholith contact between the two showings, and 915 m were drilled in eight BQ diamond drill holes.

Approximately 1,000 geochemical samples were collected. At each location, a sample was collected for analysis for W and Cu, and a 2.5 to 3 kg sample was collected, panned and UV lamped for a scheelite grain count.

An anomalous area 1,900 m by 500 to 1,000 m was defined by the 200 grain contour in the HIDDEN area. The 2,000 grain contour outlined an area of 1,000 m by 300 m, within which many pan samples contain greater than 10,000 grains. Geochemical analyses indicate that 100 ppm W is equivalent to about 200 grains scheelite, and 200 ppm W is equivalent to about 2,000 grains scheelite.

Three holes were drilled to intersect the inferred downdip extension of the HIDDEN showing to the southeast but did not encounter skarn or scheelite mineralization. Four holes drilled to test geochemical anomalies showed only minor dark green siliceous skarn and occasional scheelite. A hole drilled beneath the showing from the northwest intersected a 2 m section of 0.95% WO_3 within veined and brecciated dolomite along a strong fault zone, believed to be unrelated to surface mineralization. One trench on the HIDDEN showing graded 1.72% WO_3 over 1.5 m at the face and 0.91% WO_3 over 4 m on the floor, although it did not reach bedrock.

In 1981, a ground proton magnetometer survey was conducted over four claims.

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LORNE	Lead, Silver
Great Western Petroleum	105 F 10 (100)
Corporation	(61°37'N,132°52'W)

References: GSC Open File Report 564.

Claims: LORNE 1-55

Source: Summary by P. Watson from assessment report 090979 by L.K. Eccles.

History:

The LORNE claims were staked in 1981 on behalf of Seagull Joint Venture to cover anomalous Ba, Pb, Zn and Ag values reported in GSC Open File Report 564. They were staked around the JEFF 1-4, JIM 1-2 and HI GRADE claims.

Description:

The area is underlain by Cambrian phyllites with some greywacke and/or tuffs and thick-bedded dolomite. Quartz veins up to one m in width cut both units but are more common in the dolomite. The main showing consists of boulders of massive sulphide float, up to 30 m by 5 cm, found on the JEFF claims. Elsewhere on the LORNE claims galena occurs as narrow fracture fillings and as blebs up to 3 cm in size in the dolomite. The best showing on LORNE consists of large pods of galena, up to 10 cm by 30 cm, found in talus. The galena mineralization is often masked by a grey, powdery cerussite coating.

Current Work and Results:

During the 1981 program, 101 stream sediment, 78 soil and 12 rock samples were analyzed for Cu, Pb, Zn, Ag and Au. Soil samples were considered anomalous if they contained greater than 80 ppb Au, 4.0 ppm Ag, 1,568 ppm Zn, 328 ppm Pb or 240 ppm Cu. Stream sediment samples containing greater than 80 ppb Au, 4.8 ppm Ag, 1,808 ppm Zn, 560 ppm Pb or 232 ppm Cu were considered anomalous.

High silver values were found where phyllites outcropped and where galena occurs in dolomite. The highest Pb values were coincident with high Ag. Zinc was high over the entire property, and Cu and Au values were generally low.

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MOX	Copper, Lead, Zinc
Canadian Occidental	Silver Skarn & Veins
Petroleum Limited	105 F 11 (101)
	(61° 30'N, 133° 18'W)

References: GSC Open File Report 564; D.I.A.N.D. (1981, p. 176, see "LAST").

Claims: MOX 1-14; MOX 16-17; MOX 19; MOX 21-60; MORE-BETTER 1-8

Source: Summary by P. Watson from assessment report 090641 by E.J. Sacks, and assessment report 090832 by M.J. Crandall.

History:

MOX 1-60 were staked in 1979 to cover a GSC-URP stream sediment and water uranium-fluorine-lead anomaly, but several of these claims were disallowed or converted to fractions, as they overstaked the FIRST claim group of Archer, Cathro and Associates Limited: Cub Joint Venture (LAST, #63). In 1981, 8 MORE-BETTER claims were added adjacent to MOX.

Description:

The property is underlain by regionally metamorphosed Proterozoic sedimentary rocks (quartzites, marbles and calc-silicates), schists, gneisses and migmatites of the Nasina Shelf or the Cassiar Platform. These have been intruded by a network of Cretaceous biotite granodiorite and quartz monzonite dykes and sills. A later complex of aplite and pegmatite dykes has crosscut all of these units and caused some hydrothermal alteration. In turn, all units are cut by pyritic quartz feldspar porphyry dykes and quartz veins.

Three types of mineralization have been noted on the property: skarn mineralization; impure recrystallized limestone with syngenetic mineralization; vein and/or fracture-related mineralization.

Current Work and Results:

In 1979, 1980 and 1981, reconnaissance and then detailed geological and geochemical surveys were conducted. In 1981, some sections of the claim block were covered by magnetic and VLF-EM surveys.

In 1979, 3 heavy mineral, 31 stream sediment, 31 stream water, 23 soil and 23 rock samples were collected and analyzed for up to 11 elements. Sulphide-bearing skarns in limy horizons, containing pyrite, pyrrhotite and, in one instance, galena, sphalerite and chalcopyrite were found. Copper-lead-zinc -silver-(molybdenum-tungsten) anomalies were found in stream sediments and heavy mineral samples from streams draining the mineralization, and anomalous lead, zinc and silver values were found in soils downslope of the skarn. High silver, and lesser copper, zinc and lead values, were found in soils in the northwest corner of the property, matched by stream sediment and heavy mineral anomalies.

In 1980 and 1981, 412 soil and 97 rock samples were analyzed for copper, lead, zinc and silver. Some rocks were also analyzed for gold, bismuth, arsenic and antimony. Geological mapping was carried out at 1:2,500 or 1:5,000, and VLF-EM and magnetometer surveys were also run.

Eleven soil anomalies were defined, samples being considered anomalous if containing greater than 80 ppm Pb, 180 ppm Zn and 1.4 ppm Ag. The main magnetometer response was attributed to pyrrhotite, so this technique located the pyrrhotite-bearing skarns. VLF-EM responses were believed to indicate underlying structures, although some correlated well with the mineralized skarns. Ten anomalies were outlined which correlated reasonably well with soil anomalies. A combination of VLF-EM, magnetometer and soil survey results indicated 14 anomalous areas of interest.

Skarn showings, although containing up to 1,500 ppm Pb, 2,000 ppm Zn and 100 ppm Ag, were found to be too small to produce any significant tonnages.

Twelve areas of similar, fine-grained, disseminated copper-lead-silver mineralization in impure carbonates are believed to represent syngenetic mineralization and are often characterized by black iron -manganese oxide staining. Up to 5% galena, 5% sphalerite and rare chalcocite and malachite were reported, with average values of 1.31% Pb, 1.36% Zn, 196 ppm Ag and 0.32% Cu.

Three veins (up to 1 m wide) were located, containing coarse galena in vugs in the veins and some disseminated pyrite and/or pyrrhotite. These contained 455 ppm to 1.14% Pb, 630 ppm to 2% Zn and 2.3 to 90 ppm Ag.

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PISA	Geochemical Target
Canadian Occidental	105 F 3 (103)
Petroleum Limited	(61°08'N,133°22'W)

Reference: GSC Open File Report 564

Claims: PISA 1-25

Source: Summary by P. Watson from assessment report 090643 by E.J. Sacks.

Description:

The claim group is underlain by a complex metamorphic-intrusive assemblage consisting of mid-Cretaceous perthite megacrystic biotite-quartz monzonite which has intruded Proterozoic and/or Lower Cambrian, biotite -muscovite-quartz-feldspar gneiss (granodiorite gneiss) and augen gneiss. This assemblage has been intruded by diorite/diabase dykes and coarse muscovite-garnet-tourmaline-beryl-sphene pegmatite.

Current Work and Results:

The claims were staked in 1979 to cover a GSC-URP 291 ppm uranium stream sediment anomaly, and geological and geochemical surveys were undertaken the same year. During these surveys, 1 heavy mineral, 13 stream sediment, 27 soil and 16 rock samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, U, Th and W. Rock and heavy mineral samples were also analyzed for Sn. Thirteen stream water samples were analyzed for Ag, As and F.

Highly anomalous uranium and tungsten values were reported for quartz monzonite samples in the western part of the claims. The pegmatites and mafic intrusions contain moderately anomalous amounts of uranium and tungsten. No anomalous values were found in the granodiorite gneiss.

Soils are moderately anomalous in uranium, copper, molybdenum, lead and zinc in an area which provides the potential source for anomalous uranium, copper, lead and zinc stream sediment samples.

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SAL	Geochemical Target
Canadian Occidental	105 F 4 (104)
Petroleum Limited	(61°12'N,133°53'W)

Reference: GSC Open File Report 564.

Claims: SAL 1-25

Source: Summary by P. Watson from assessment report 090642 by E.J. Sacks.

History:

The SAL 1-25 claims were staked in 1979 to cover a GSC-URP 227 ppm uranium stream sediment anomaly.

Description:

The area is underlain by mid-Cretaceous, foliated, non-porphyritic, muscovite-biotite quartz monzonite and granite of the Quiet Lake Batholith, cut by several northeast-trending lamprophyre dykes. A southeast-trending fault zone cuts the southeastern part of the property. Jointing is pervasive, commonly associated with hematite, sericite and geochemically high uranium and tungsten values.

Current Work and Results:

Reconnaissance geological and geochemical surveys were conducted in 1979. Twelve stream sediment, 27 soil and 7 rock samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, U, Th and W. Rocks were also analyzed for Sn. Twelve stream water samples were analyzed for Ag, As and F.

Very strong stream sediment, stream water and soil uranium anomalies were found in the central part of the claim group, on strike with the fault zone. All stream sediment samples taken in the GSC-sampled creek contained anomalous uranium (greater than 38 ppm U), with values ranging from 72 ppm to 0.105% U_3O_8. No mineralization was reported.

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TIER
Canadian Occidental
Petroleum Limited

Geochemical Target
105 F 9 (105)
(61°40'N,132°15'W)

Reference: GSC Open File Report 564

Claims: TIER 1-36

Source: Summary by P. Watson from assessment report 090636 by E.J. Sacks, and assessment report 090842 by F.W. Gottings.

Description:

The claims were staked to cover a GSC-URP stream sediment Mo (16 ppm) - Cu (52 ppm) - Ba (2,500 ppm) - F (1,000 ppm) anomaly. They are underlain by a folded sequence of Devonian to Triassic volcanic, pyroclastic and sedimentary rocks, including dacite, rhyolite, pyroclastics, tuff, sandstone, black shale and chert. A klippe of Silurian dolomite has been thrust over the younger assemblage.

Current Work and Results:

Geological, geochemical and radiometric surveys were carried out in 1979 and/or 1980. In 1979, 11 rock, 20 stream sediment, 20 stream water, 3 heavy mineral and 16 soil samples were collected and analyzed for up to 11 elements. Stream sediment and heavy mineral samples produced several molybdenum, zinc and, to a lesser extent, copper, lead and silver anomalies. A bright orange gossan over the dacitic volcanic rocks returned generally low values, except for a strong, coincident molybdenum soil anomaly.

In 1980, an additional 14 rock, 38 stream sediment, 2 heavy mineral and 109 soil samples were collected and analyzed for Cu, Mo, Ag, U and Zn. Soils, which had generally erratic results, were highest in zinc, copper, silver and uranium over the south central dacite tuff. Soils were considered anomalous if they contained greater than 45 ppm Cu, 11 ppm Mo, 1.2 ppm Ag, 3 ppm U or 180 ppm Zn. Stream sediments in the eastern half of the property were anomalous in zinc, copper and uranium. Radiometrics outlined the main gossan zones. The only visible mineralization was trace pyrite in the dacitic volcanic rocks.

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OXY
Canadian Occidental
Petroleum Limited

Geochemical Target
105 F 7 (106)
(61°16'N,132°50'W)

Reference: GSC Open File Report 564

Claims: OXY 1-48

Source: Summary by P. Watson from assessment report 090627 by E.J. Sacks.

History:

The OXY claims were staked in June, 1979 to cover the headwaters of a GSC-URP stream sediment U-Mo-W anomaly, and partially enclose the CASTOR claims (Eldorado Nuclear Limited).

Description:

The claims are underlain by Cretaceous biotite-quartz monzonite of the Nisutlin Batholith, that has intruded upper Paleozoic quartzite and meta-siltstone. Upper Paleozoic ultramafic rocks have been thrust (?) over this assemblage from the southwest (Tempelman-Kluit 1977). No mineralization was noted.

Current Work and Results:

Geological and geochemical surveys were conducted in 1979. A total of 11 rock, 2 heavy mineral, 19 stream sediment, 18 stream water and 21 soil samples were collected and analyzed for some combination of the following: Cu, Mo, Pb, Zn, Ag, U, Th, Sn, W, F and As.

Anomalous uranium values (up to 23 ppm) were found in quartzite and quartz monzonite in the central portion of the property, and are accompanied by a uranium soil anomaly. An intense copper soil and stream sediment anomaly occurs in talus derived from the ultramafic rocks in the northwest corner of the claim group.

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BIG OX
Canadian Occidental
Petroleum Limited

Geochemical Target
105 F 7 (107)
(61°19'N,132°50'W)

Reference: GSC Open File Report 564

Claims: BIG OX 1-72

Source: Summary by P. Watson from assessment report 090634 by E.J. Sacks.

History:

The BIG OX claim group was staked in 1979 to cover a multi-site GSC-URP stream sediment uranium-tungsten-fluorine anomaly.

Description:

Cretaceous perthite megacrystic, biotite-quartz monzonite of the Nisutlin Batholith underlies the entire property and is cut by diabase dykes in the western part of the claim group. Numerous northeast trending fracture zones containing limonite, chlorite and quartz-carbonate veins cut the intrusives. No mineralization was reported.

Current Work and Results:

Geological and geochemical surveys were carried out in 1979. Some or all of Cu, Mo, Pb, Zn, Ag, U, Th, Sn, W, As and F were analyzed for in 14 rock, 37 soil, 10 each stream sediment and stream water samples, and 1 heavy mineral sample. Anomalous contents of uranium and tungsten are associated with limonitized fracture zones containing quartz-carbonate veins. Stream sediments, water and heavy mineral samples derived from the fracture zones contain anomalous uranium and tungsten (plus molybdenum and silver).

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1981 MINERAL CLAIMS STAKED

FER
O. Rothbauer
105 F 3 (98)
(61°12'N,133°13'W)

Claims 1981: FER (2)

GOPHER
Skagway Moly Incorporated
105 F 4 (4)
(61°03'N,133°49'W)

Claims 1981: MOLY (16)

WOPUS
Golden Empire
105 F 4 (3)
(61°02'N,133°44'W)

Claims 1981: GE (8); BOSS (3)

IOLA
AGIP Canada Ltd.
105 F 6 (5)
(61°22'N,133°19'W)

Claims 1981: BARB (72)

NCC
T. McCrory et al
105 F 9 (99)
(61°38'N,132°06'W)

Claims 1981: NCC (64)

KOPINEC
P. Woloszenuik
105 F 9 (16)
(61°32'N,132°13'W)

Claims 1981: PETRO (2)

GRAYLING
T. McCrory et al
105 F 10 (20)
(61°37'N,132°37'W)

Claims 1981: NEX (36)

LORNE
D. Raithby et al
105 F 10 (100)
(61°36'N,132°50'W)

Claims 1981: LORNE (55)

MOX
Canadian Oxidental Petroleum Company Limited
105 F 11 (101)
(61°31'N,133°16'W)

Claims 1981: MORE BETTER (8)

SNERD
J. Cuttle et al
105 F 11 (102)
(61°35'N,133°14'W)

Claims 1981: SNERD (16)

BARITE MOUNTAIN
C.W. Friday Contracting
105 F 14, 15 (32)
(61°50'N,133°00'W)

Claims 1981: CHAR (18)

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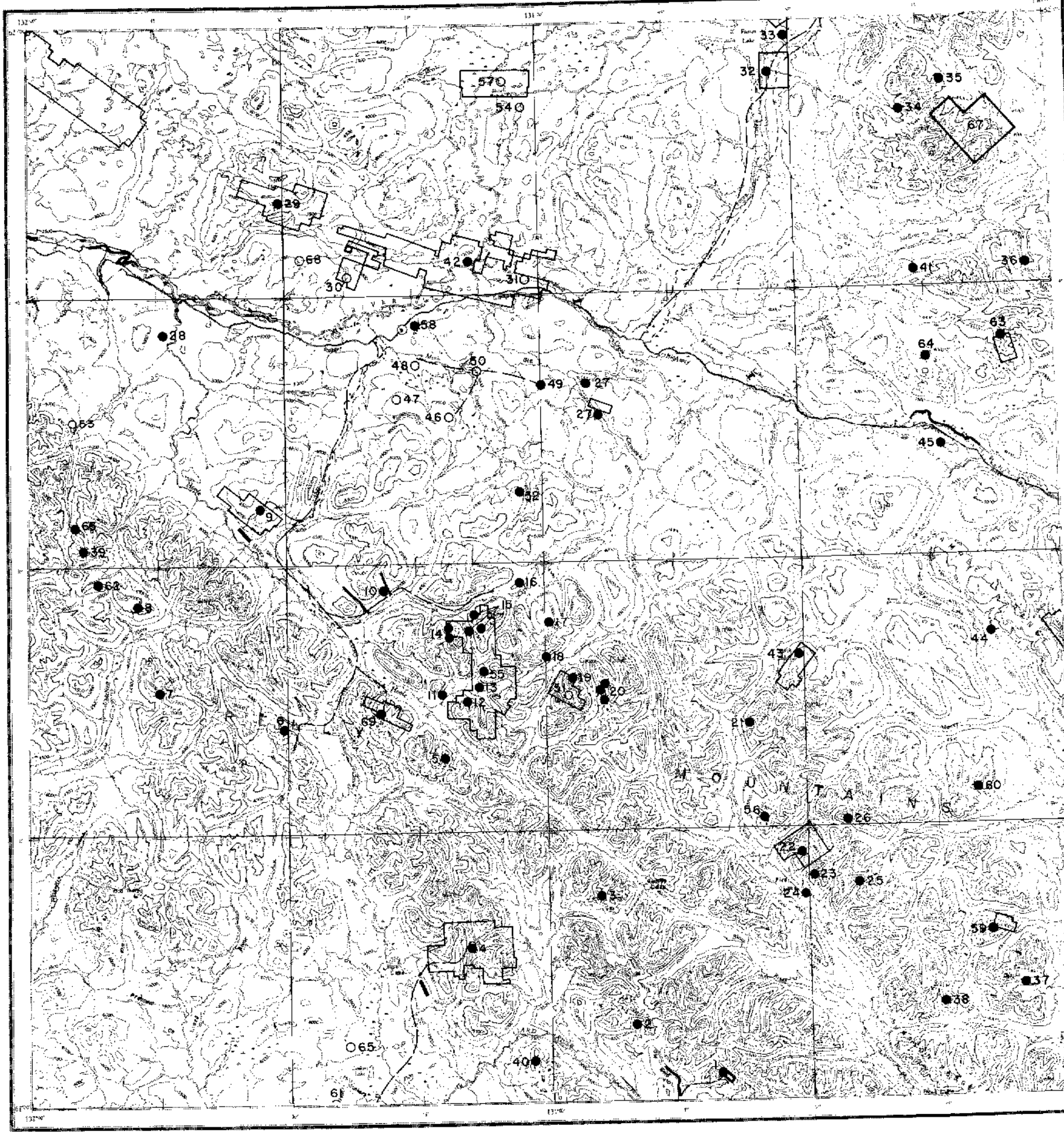
105 G



FINLAYSON LAKE

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.... Mineral Claims staked in 1981

.... Prospecting Leases in good standing (April 1982)

.... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

FINLAYSON LAKE MAP-AREA (NTS 105 G)

General Reference: GSC Open File 486 by: D.J. Tempelman-Kluit, 1977.

NO.	PROPERTY NAME	REFERENCE
1	MONT	Findlay (1967, p. 64-65); This Report
2	BLUEBERRY	Silver-Lead-Zinc-Copper-Tungsten Vein
3	SLAM	Zinc-Copper Vein
4	TINTINA	Green & Godwin (1963, p. 26-29); Sinclair et al (1975, p. 156-158)
5	PLUMB	Lead-Zinc-Silver Vein
6	FH	Silver-Lead-Zinc-Copper Occurrence
7	McNEIL	Copper
8	AXE	Craig & Laporte (1972, p. 131)
9	HOO	Sinclair & Gilbert (1975, p. 85-86)
10	EL	Findlay (1969a, p. 79)
11	PICK	Silver-Lead Vein
12	GRASS	Molybdenum-Tungsten Vein
13	SANDERS	Skarn Lead-Zinc-Copper
14	RILEY	Copper-Lead Vein
15	ZIELINSKI	Lead-Zinc-Copper-Silver Vein
16	RIVIERA	Copper-Zinc Stratabound
17	GYP	Lead-Zinc-Copper Vein
18	GEE	Lead Vein
19	PIT	Zinc-Copper-Silver-Gold Vein
20	ROB	Copper-Lead-Silver Vein
21	PACK	D.I.A.N.D. (1981, p. 180)
22	FYRE	This Report
23	TOP	Silver-Lead-Zinc Vein
24	DUB	Findlay (1967, p. 59-60)
25	MM	Skarn Copper
26	VINCENT	Copper Vein
27	BOT	Asbestos
28	PUP	Asbestos
29	CHOW	Lead-Zinc-Silver Vein
30	DOL	
31	CAMPBELL	Keele (1910, p. 50)
32	PHIL	D.I.A.N.D. (1981, p. 180, 182)
33	PAY	Findlay (1969a, p. 81-83)
34	RIS	Copper Vein
35	SPUD	Tempelman-Kluit (1974, p. 44)
36	JAKE	Silver-Lead-Zinc Vein
37	MAP	Silver-Lead Vein
38	WATERS	Silver-Lead Vein
39	ZIMMER	Copper
40	INGS	Copper Vein
41	HARMAN	Sinclair & Gilbert (1975, p. 88)
42	ELECTRIC	This Report
43	MYDA	D.I.A.N.D. (1981, p. 180)
44	FETISH	
45	QUANDARY	
46	FREGERG	
47	FLIN	
48	FLON	
49	HUDSON	
50	AIRBORNE	
51	TOKE	D.I.A.N.D. (1981, p. 180)
52	FOG	D.I.A.N.D. (1981, p. 181)
53	STARR	D.I.A.N.D. (1981, p. 182)
54	GONZO	D.I.A.N.D. (1981, p. 182)
55	BOOT	D.I.A.N.D. (1981, p. 181)
56	HOWDEE	D.I.A.N.D. (1981, p. 182)
57	DWONK	D.I.A.N.D. (1981, p. 182)
58	EAGLE	D.I.A.N.D. (1981, p. 182)
59	PY	Sinclair et al (1976, p. 164)
60	MONEY	Sinclair et al (1976, p. 166)
61	BOW	Morin et al (1979, p. 85)
62	NMT	Morin et al (1977, p. 203)
63	TIL	Morin et al (1980, p. 65)
64	IRENE	Morin et al (1980, p. 67)
65	PAT	Morin et al (1979, p. 85)
66	NEW	Morin et al (1979, p. 87)
67	SAS	This Report
68	LEACH	Morin et al (1980, p. 67)
69	CYR	Morin et al (1980, p. 64)

FYRE
Welcome North Mines Limited; Esperanza Explorations Limited

Pyrite Massive Sulphide
105 G 1,2 (22,23,24)
(61° 14'N,130° 31'W)

References: Morin (1981, in D.I.A.N.D. 1981, p. 91-97); Morin et al (1979, p. 85).

Claims: KONA 1-68

Source: Summary by P. Watson from assessment report 090920 by W.J. Crawford.

Current Work and Results:

The KONA claims were staked over the known FYRE LAKE showings (see TOP, DUB, FYRE) in 1980, following the discovery of a disseminated chalcopyrite extension of the original showings. The property was examined in 1980 and a soil geochemistry program conducted in 1981.

The 1980 program covered 16.9 km of grid, and 255 samples were collected and analyzed for Cu, Pb and Zn. This survey clearly delineated the northwest-trending zone of essentially cupriferous iron formation facies grading over 1,500 m from massive sulphides (pyrite and chalcopyrite) through oxide iron formation (magnetite and chalcopyrite) into cupriferous greenschist (chalcopyrite).

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ELECTRIC
Hudson Bay Exploration and Development Company Limited

Lead, Zinc
105 G 14 (42)
(61°46'N,131°15'W)

References: Morin et al (1980, p. 66-67); Morin et al (1979, p. 88).

Claims: SHALE (83); FRED (4); RENO (66); BINGO (16); BIG (38); EAGLE (44). A total of 251 claims.

Source: Summary by P. Watson from assessment report 090835 by R. Stroshein.

History:

In 1908, the ELECTRIC MINE claim was staked by Fred Eagle on a galena vein crossing "Devils Canyon", although the exact location is not known. The EAGLE, SHALE and RENO claims were staked by Pelly Banks Syndicate in 1977 and 1978, and BINGO was added in May, 1980. Hudson Bay Exploration and Development Co. Ltd. staked the BIG claims in May-June, 1980.

In 1978 to 1980, prospecting, soil geochemistry, EM-16, airborne EM, magnetometer and gravity surveys were carried out on various parts of these claim blocks. In addition, some trenching and 444.8 m of diamond drilling in four holes were completed.

In 1979, Hudson Bay Exploration and Development Co. Ltd. optioned SHALE, FRED, RENO, BIG and BINGO 1-4 from Pelly Banks Syndicate. During 1980, they conducted MAX-MIN EM magnetometer and gravity surveys, along with geological mapping and rock geochemistry. The EAGLE and BINGO 5-16 claims are covered under an option agreement with Arbor Resources Limited.

Description:

The property is underlain by an east-west trending section of Klondike Schist. Four units were mapped on the property: quartz-chlorite-sericite schist, with some disseminated pyrite and lead-zinc mineralization; carbonaceous quartz phyllite and quartz chlorite phyllite, a siliceous unit which grades upwards into strongly graphitic phyllite; calcareous quartz-chlorite phyllite; and metavolcanic rocks consisting of "greenstone" and quartzite. Mineralization is found in the transitional zone between the graphitic phyllite and the calcareous phyllite.

The Robert Campbell Highway crosses the southeastern part of the claim block, allowing easy access to that portion of the ground south and east of the Pelly River. A cat road also exists from the highway to the river.

Current Work and Results:

During 1981, diamond drilling and cat trenching were undertaken in conjunction with an Apex MAX-MIN II survey used to locate drill sites. Seven NQ holes were drilled to a total of 683.4 m.

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SAS
Gulf Minerals Canada Limited

Geochemical Target
105 G 16 (67)
(61°50'N,130°05'W)

Claims: SAS 1-150

Source: Summary by P. Watson from assessment report 091002 by E.P. Dillon.

Description:

The claims were staked to cover the possible source of stream sediment geochemical anomalies discovered during a 1980 reconnaissance program. They are underlain by a Devonian clastic sequence of siltstones, shales and interbedded cherts that has been intruded by probably Cretaceous biotite granodiorite and hornblende gabbro.

Current Work and Results:

During 1981, 340 soil and 181 stream sediment samples were collected and analyzed for Pb, Zn, Ag, Ba and V. Threshold values for soil samples were calculated as 35 ppb Pb, 205 ppm Zn, 1.5 ppm Ag and 1900 ppm Ba. A coincident Pb-Zn-Ag-Ba anomaly occurs on the property as well as several scattered anomalies. Only scattered Zn and Ba anomalies are found in stream sediment samples.

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1981 MINERAL CLAIMS STAKED

MONT
R. Close

105 G 2 (1)
(61°01'N,130°40'W)

Claims 1981: DAVE (2)

SAS
Gulf Minerals Canada Limited

105 G 16 (67)
(61°53'N,130°08'W)

Claims 1981: SAS (150)

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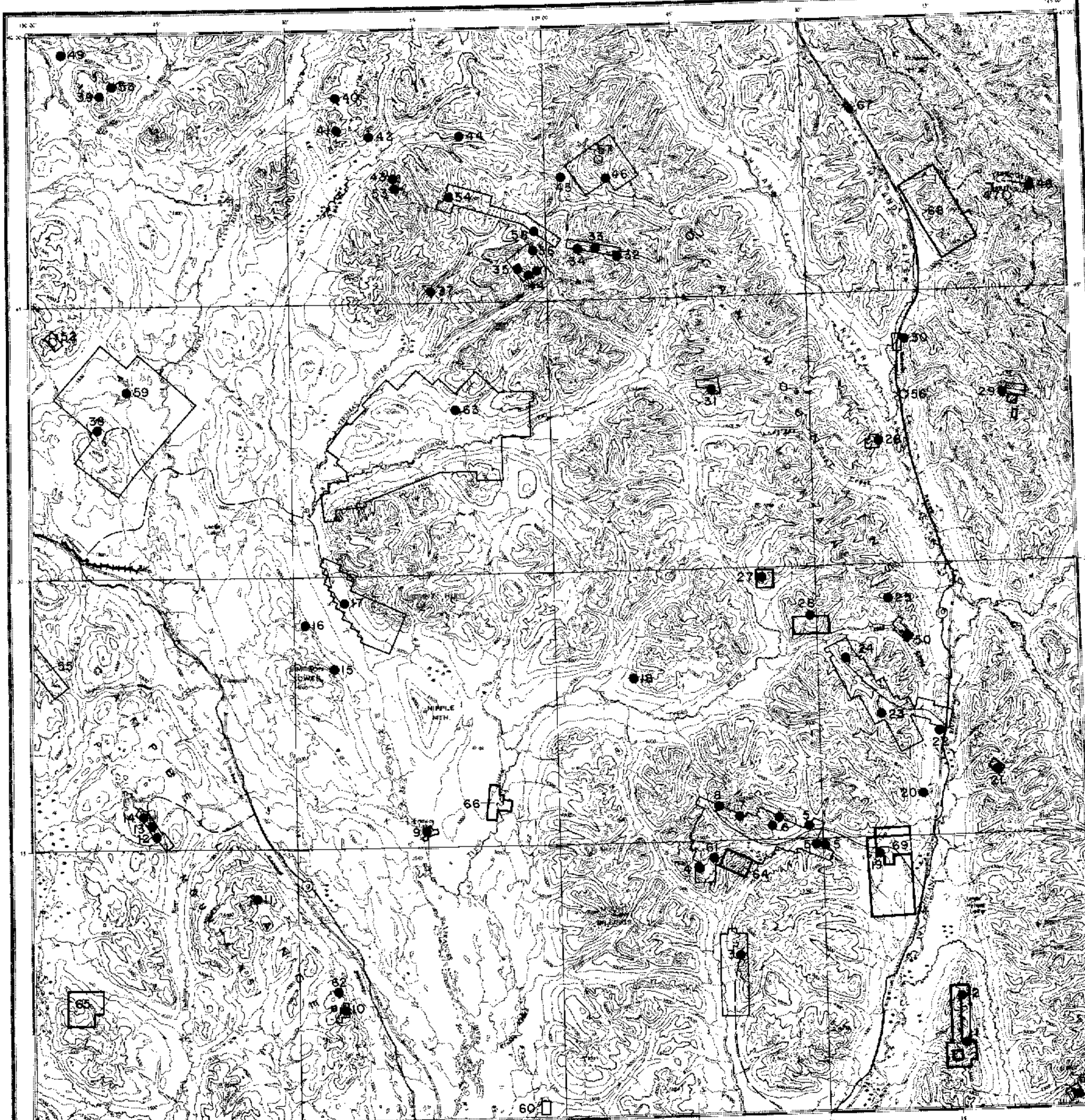
105 H



FRANCES LAKE

YUKON TERR.—NORTHWEST TERR.

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

FRANCES LAKE MAP-AREA (NTS 105 H)

General Reference: GSC Map 6-1966 by: S.L. Blusson, 1966

NO.	PROPERTY NAME	REFERENCE
1	JAN	This Report
2	MIDAS	This Report
3	FLIP	D.I.A.N.D. (1981, p. 185)
4	DC	Green (1966, p. 72)
5	MIKO	This Report
6	GLENNA	This Report
7	STEELE	Sinclair & Gilbert (1975, p. 81-82)
8	MAX	Sinclair & Gilbert (1975, p. 81-82)
9	FRANCES	Copper Vein
10	LIND	Asbestos
11	DOUG	Copper Vein
12	TUCHITUA	D.I.A.N.D. (1981, p. 185)
13	EKO	Asbestos-Jade
14	DIM	Asbestos
15	MAY	Green (1966, p. 72)
16	MAPEL	Copper-Lead-Zinc Vein
17	MATT BERRY	This Report
18	FLUKE	D.I.A.N.D. (1981, p. 186)
19	CANYON	Skarn Silver-Lead-Zinc; This Report
20	STU	Blusson (1966)
21	TERRY	Skarn Tungsten; This Report
22	CORRIE	Copper Occurrence
23	BLACK JACK	D.I.A.N.D. (1981, p. 186, 188); This Report
24	FIR TREE	D.I.A.N.D. (1981, p. 186, 188); This Report
25	MONTSE	Skarn Tungsten
26	RON	Green (1966, p. 68-71); This Report
27	HELEN	Blusson (1966); This Report
28	BROD	D.I.A.N.D. (1981, p. 186)
29	RAIN	D.I.A.N.D. (1981, p. 188); This Report
30	ROAD	Green (1968, Figure 1); D.I.A.N.D. (1981, p. 188)
31	TOY	Skarn Silver-Lead-Zinc-Copper
32	BR	Skarn Tungsten-Copper
33	TANYA	Craig & Milner (1975, p. 117)
34	GUY	Green (1968, Figure 1)
35	THOR	This Report
36	BROTEN	Skarn Tungsten-Copper-Molybdenum
37	TUSTLES	Copper Occurrence
38	TED	This Report
39	NARCHILLA	Skarn Tungsten-Copper-Lead-Zinc
40	LEE	D.I.A.N.D. (1981, p. 188)
41	YUSEZYU	Blusson (1966)
42	DODGE	Skarn Molybdenum
43	TILLEI	Molybdenum-Tungsten Porphyry
44	HITCH HIKER	Silver-Lead-Zinc Vein
45	ZEUS	This Report
46	CHAP	This Report
47	ALM	Skarn Lead-Zinc
48	BUS	Skinner (1961, p. 46)
49	TIM	Skarn Lead-Zinc-Copper
50	SUSAN	This Report
51	LAN	D.I.A.N.D. (1981, p. 187)
52	TIN	D.I.A.N.D. (1981, p. 187)
53	VIKING	D.I.A.N.D. (1981, p. 187)
54	WOAH	D.I.A.N.D. (1981, p. 187)
55	JULIA	This Report
56	TINY	D.I.A.N.D. (1981, p. 188)
57	AURORA	This Report
58	TAI	D.I.A.N.D. (1981, p. 187)
59	FIN	This Report
60	HAWK	This Report
61	SUZANNE	Morin et al (1977, p. 207)
62	KING ARCTIC	Morin et al (1977, p. 208)
63	MAXI	Morin et al (1980, p. 67-68)
64	ON	This Report
65	KNEIL	This Report
66	TYER	This Report
67	LYNX	This Report
68	TUNA	This Report
69	GEL	This Report

JAN
Majestic Mining Corporation

Gold, Copper Skarn
105 H 1 (1)
(61°04'N,128°15'W)

Reference: D.I.A.N.D. (1981, p. 185).

Claims: PRINCESS 1-12

Source: Summary by P. Watson from assessment report 090927 by D.W. Tully.

Current Work and Results:

Prospecting in 1980 was followed by soil geochemistry, VLF-EM and magnetic surveys in 1981. A total of 246 soil samples was collected and analyzed for Cu, Pb, Zn and Ag. Soils were considered anomalous if they contained greater than 80 ppm Cu, 50 ppm Pb, 300 ppm Zn or 0.4 ppm Ag. Seven anomalous locations were noted. A zone of VLF-EM apparent conductor anomalies trends north through the central part of the claims approximately coincident with magnetic highs.

MIDAS
Pacific Tungsten Corporation

Skarn
105 H 1 (2)
(61°05'N,128°15'W)

Claims: ZEST 1-18

Source: Summary by P. Watson from assessment report 090989 by D.W. Tully.

Description:

The area is underlain by Cambrian or earlier gneisses and schists, late Paleozoic calcareous and pelitic metasedimentary rocks and Cretaceous(?) quartz monzonite and granodiorite. Limonitic gossan zones located on the property contain fine disseminated pyrite, pyrrhotite, chalcopyrite, sphalerite and galena. The area was prospected in the 1950's and 1960's and is located 7 km east of the Nahanni Range Road.

Current Work and Results:

The 1981 program consisted of geochemical, VLF-EM and magnetometer surveys. A total of 256 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples containing greater than 60 ppm Cu, 90 ppm Pb or 240 ppm Zn were considered anomalous. The highest Ag value was 0.9 ppm. Several zones anomalous in Cu, Zn or Pb and one coincident Cu-Zn-Pb anomaly were reported. One magnetic anomaly and five apparent EM conductors were located.

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MIDAS
Pacific Rim Energy Corporation
105 H 1 (2)
(61°05'N,128°14'W)

Claims: ZEBRA 1-18

Source: Summary by P. Watson from assessment report 090985 by D.W. Tully.

Description:

These claims are located two km north of known Cu, Pb and Zn mineralization, 10 km east of the Nahanni Range Road. Work in the general area in the 1960's discovered zones of gossan in skarn and hornfels carrying Fe, Cu, Pb and Zn sulphides with Au and Ag. The area is underlain by a Cambrian and Proterozoic(?) schist and gneiss complex which has been intruded by feldspar porphyry and quartz monzonite of Cretaceous(?) age.

Current Work and Results:

VLF-EM, magnetometer and geochemical surveys were conducted in 1981. A total of 267 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples were considered anomalous if they contained greater than 60 ppm Cu, 90 ppm Pb, 240 ppm Zn or 1.0 ppm Ag. Three anomalous Cu zones, 10 anomalous Pb zones and 12 anomalous Zn zones were outlined. Three strong, coincident Pb-Zn-Cu anomalies were delineated. Only isolated, one-sample Ag anomalies were noted.

A northwest-trending zone of magnetic anomalies occurs in the southwestern corner of the claim block, generally coincident with geochemical anomalies. Four apparent EM conductors were outlined.

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MIDAS
Newline Resources Limited;
J.C. Turner
Skarn
105 H 1 (2)
(61°07'N,128°15'W)

Claims: ZULU 1-16

Source: Summary by P. Watson from assessment report 090997 by D.W. Tully.

Description:

The area is underlain by Cambrian or earlier gneisses and schists, late Paleozoic calcareous and pelitic metasedimentary rocks and Cretaceous(?) quartz monzonite. Oxidized zones of sulphide mineralization were found on the claims. The area was prospected in the 1950's and 1960's and is located 7 km east of the Nahanni Range Road.

Current Work and Results:

Geochemical, magnetometer and VLF-EM surveys were conducted in 1981. A total of 276 soil samples were collected and analyzed for Cu, Pb, Zn and Ag. Samples containing greater than 60 ppm Cu, 75 ppm Pb or 200 ppm Zn were considered anomalous, and one coincident Cu-Pb-Zn anomalous zone was outlined. Magnetic response was poor. A northwest-trending zone of short, apparent EM conductors of modest intensity was located.

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MIKO
Patmar Resources Corporation
Lead, Zinc, Silver
Skarn
105 H 1,2 (5)
(61°15'N,128°30'W)

Reference: Craig and Laporte (1972, p. 133-134).

Claims: MARINA 1-16

Source: Summary by P. Watson from assessment report 090828 by D.W. Tully.

History:

Pb, Zn, Cu, Ag mineralization was first discovered here in the mid-sixties (MIKO), when trenching and drilling programs were carried out. The MARINA 1-16 claims were staked in the summer of 1978 and can be accessed by a 20 km road from km 78 on the Nahanni Range Road.

Description:

These claims cover the intrusive contact between late Paleozoic metasediments, such as impure quartzite, marble and various schists, and Cretaceous quartz monzonite. Most calc-silicates have been altered to skarns, marked by epidote. Several skarn zones with Pb -Zn-Ag mineralization are located on the property.

Current Work and Results:

In the summer of 1980, three BQ diamond drill holes were completed to a total depth of 287.04 m. These holes were drilled to examine one skarn zone of 6-7 m width and significant strike length. The first hole was lost at 37.65 m but the other two holes encountered several skarn bands, up to 8 m in drill width and containing low values of Pb, Zn, Au and Ag. One 0.43 m section assayed 3.45% Pb, 2.35% Zn, 165 ppm Ag and 6.8 ppm Au. Mineralization occurs in fissures in the skarn zone, posssibly related to post-skarn emplacement fracture patterns.

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GLENNA
Morning Star Mines Limited (N.P.L.)

Silver, Lead, Zinc
Copper Skarn
105 H 7 (6)
(61°16'N,128°33'W)

Claims: MARG 1-23

Source: Summary by P. Watson from assessment report 090827 by D.W. Tully.

History:

The GLENNA and LAKE claims were staked in 1964, and during the sixties various companies carried out trenching, soil geochemistry, a magnetometer survey and a total of 2,139.3 m of diamond drilling. A road was put in from the Nahanni Range Road to the property (20 km). The MARG 1-23 claims were staked over the mineralization in 1978 and optioned to Morning Star Mines Limited (N.P.L.). In 1979, bulldozer trenching and 641.3 m of diamond drilling in seven holes were completed.

Description:

The property is underlain by a series of metasedimentary rocks, intruded in the northeastern part of the property by Cretaceous granodiorite-quartz monzonite. The metasedimentary rocks are impure quartzite, impure marble, quartz-mica schist, paragneiss and skarn.

Within 120 m of the intrusive contact, skarns enriched in epidote and magnetite are common. Further away, skarns may carry lead-zinc mineralization but less magnetite. Up to 25 concordant skarn bands, averaging 1 m in thickness occur within a 90 m horizon and can be traced as outcrop and float for 8.8 km. Sphalerite, galena, pyrrhotite, magnetite, chalcopyrite and minor scheelite mineralization is found as small pods and lenses and as disseminations within the skarns.

Current Work and Results:

In 1980, two holes were drilled for a total of 282.6 m. These were drilled to intersect a strong shear carrying Zn-Pb-Ag and pyrite mineralization, but the surface showings did not continue at depth. Only weak zones of mineralization were found in drill core, with results of 131 g Ag/t, 2.04% Pb, 2.10% Zn over 0.74 m and 99.8 g Ag/t, 2.43% Pb and 3.47% Zn over 0.91 m, reported in one hole.

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MATT BERRY
Cominco Limited

Lead, Zinc
105 H 6, 11 (17)
(61°27'N,129°25'W)

References: D.I.A.N.D. (1981, p. 185); Craig and Milner (1975, p. 122-123); Craig and Laporte (1972, p. 126-127).

Claims: BARB (167 claims)

Source: Summary by P. Watson from assessment report 090861 by T.W. Hodson.

History:

The BARB claims cover the old MATT BERRY lead-zinc prospect, which has been known and explored since the late thirties. This work covers an area southeast of the showing. Of the 167 BARB claims, 140 are part of an option agreement between Sovereign Metals Corporation and Cominco Limited, and the remaining 27 are held by Cominco Limited.

Description:

The BARB claims are underlain by Devonian to Mississippian metamorphosed mudstones and siltstones (phyllites), and volcanic rocks (quartz-sericite schists and quartz-augen schists), intruded to the east by a Cretaceous quartz monzonite. Hornfelsed phyllite is adjacent to the intrusion and minor to trace amounts of pyrite, pyrrhotite, arsenopyrite, galena and sphalerite occur in the schists.

Current Work and Results:

A total of 1,179 soil samples, 16 stream sediment samples and 34 rock samples were collected in 1981 and analyzed for Cu, Pb, Zn and Ag. Soils containing greater than 0.7 ppm Ag were considered significant. The anomalous thresholds for other elements were: 70 ppm Cu, 23 ppm Pb and 110 ppm Zn. Several coincident Pb and Zn anomalies were associated with the quartz-augen schist, which contained trace galena and sphalerite. A 400 m by 600 m area of anomalous Cu was outlined upslope from the Pb-Zn anomaly.

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BLACK JACK, FIR TREE
Shell Canada Resources Limited; Black Jack Mines

Zinc, Lead
105 H 8 (23, 24)
(61°23'N,128°27'W)

References: D.I.A.N.D. (1981, p. 188); Findlay (1967); Dawson and Dick (1978).

Claims: CAL 1-144; BRYAN (28); PEDRO (4); ANN (9); WINE (3)

Source: Summary by P. Watson from assessment report 090867 by W.A. MacLeod.

History:

The CAL 81-144 were staked in 1980, adjoining the CAL 1-80 claims. They are accessible by four-wheel drive vehicle from km 94 of the Nahanni Range Road.

Description:

The area is underlain by two clastic pelitic sedimentary sequences of Upper Proterozoic to Lower Cambrian age, which have been intruded by intermediate to felsic material of the Cretaceous Mount Billings Batholith.

Current Work and Results:

Geological mapping was conducted in 1981. The lowermost sedimentary unit includes well-bedded quartzites (sandstones) and biotite-feldspar quartzites (siltstones). Thin beds of recrystallized limestone, as well as marble containing diopside, garnet and tremolite, and siliceous dolomite containing diopside, quartz, garnet and actinolite tremolite become more common towards the top of the unit. The altered siliceous dolomite is locally mineralized with disseminated to massive pyrrhotite, pyrite and occasional sphalerite and galena.

Three showings, located to the south of the known BLACK JACK and FIR TREE showings, were sampled in 1981. The TOM showing, also examined by Shell in 1980, contains podiform pyrrhotite skarn in the upper part of the lowermost sedimentary unit. Minor sphalerite is associated with the pyrrhotite, which is found over an average thickness of 2 m and a minimum downdip extent of 71 m. Assays were generally low, the best being reported as 1.25% Zn from a representative face sample.

The second showing, BCYP, is similar to TOM in mineralogy and stratigraphic location, but smaller in size. A 2 m average width extends for 7 m along strike.

The third showing, found only in talus, consists of minor galena and sphalerite in siliceous dolomite and probably occurs in the same stratigraphic position as the first two showings.

Five BQ diamond drill holes totalling 130 m were drilled on the BRYAN and ANN claims in 1981.

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<u>THOR</u> — Molybdenum Porphyry
Union Carbide Canada Limited; — 105 H 14 (35)
Welcome North Mines Limited — (61°47'N,129°02'W)

Claims: RENA 1-36

Source: Summary by P. Watson from assessment report 090889 by C.N. Forster, D. Archibald and D.H. James.

History:

The claims were staked by Welcome North Mines Limited in 1980 to cover molybdenite showings known since the 1960's and were optioned by Union Carbide Canada Limited in December, 1980.

Current Work and Results:

During the 1981 program, geological mapping was carried out at a scale of 1:10,000 and 210 soil and stream sediment, 92 lithogeochemical and 15 pan concentrate samples were collected.

The Cretaceous Mount Billings biotite granodiorite Batholith has been intruded in this area by a potash-rich, multistage quartz monzonite stock, locally referred to as the "Rena Stock". This 5 km by 3 km elliptical stock consists of at least five distinctive intrusive phases and is highly fractured, jointed and brecciated. Molybdenite and trace scheelite (and possibly wolframite) have been noted in 13 occurrences to date, mostly in quartz sericite pyrite veins, but also occasionally along dry limonitic fracture surfaces and rarely as disseminations in the intrusive rocks. Potassic, phyllic and propylitic alteration, as well as some silicic and argillic alteration, is present. Five vein classifications have been noted, containing combinations of quartz, pyrite, scheelite, magnetite, molybdenite, sericite, chlorite and epidote.

A total of 78 rock and 210 stream sediment, soil and talus samples were collected and analyzed for Au, Mo, Ag and W. Fifteen panned stream sediments were examined for scheelite. No specific Mo or W zonation patterns were noted and most anomalous values related to known mineralization.

******

<u>TED</u> — Barite (Silver, Lead, Zinc)
Sovereign Metals Corporation Limited; — 105 H 12 (38)
Pamicon Developments Limited — (61°36'N,129°52'W)

Reference: D.I.A.N.D. (1981, p. 186).

Claims: TAN 1-96

Source: Summary by P. Watson from assessment report 090807 by D. Yeager, T.C. Scott and C.K. Ikona.

Current Work and Results:

A section of the claim group was grid soil sampled in the summer of 1980. A total of 465 samples were collected and analysed for Pb, Zn and Ag. Four coincident anomalies were delineated. Two were a combination of high silver values and moderate lead and zinc values; one was high lead and zinc, and low silver values; and one was high lead, zinc and silver values.

Rock samples collected from the 1979 trench and from float were assayed for Pb, Zn, Ag and Au. Values up to 0.43% Pb, 1.59% Zn, 48.6 g Ag/t and 0.17 g Au/t were reported.

******

<u>SUSAN</u> — Tungsten Skarn
Union Carbide Exploration Corporation — 105 H 8 (50)
(61°26'N,128°20'W)

References: Morin <u>et al</u> (1977, p. 209); Sinclair <u>et al</u> (1976, p. 168).

Claims: SUSAN (11)

Current Work and Results:

Tungsten skarn mineralization has developed within limy horizons in a Hadrynian schist-gneiss unit near the margin of a Cretaceous granitic intrusion.

In 1981, soil samples were collected over a cut grid on the SUSAN 1-9, 12 and 14 claims, and a 5 m by 4 m by 1 m pit was excavated to expose the showing.

******

JULIA
Esso Minerals Canada Limited;
Arbor Resources, Inc.

Pyrite, Copper
105 H 5, G 8 (55)
(61°25'N,130°00'W)

Claims: JULIA 1-20, 37-70

Source: Summary by P. Watson from assessment report 090858 by C.A. Aird.

History:

The JULIA 1-10 claims were staked in 1980 by Welcome North Mines Limited and Esperanza Explorations Limited following the discovery of angular boulders up to 1 m in diameter composed of massive pyrite with minor chalcopyrite, downstream of a large gossan. Arbor Resources Inc. optioned these claims and conducted soil geochemical and EM-16 geophysical surveys (by Montgomery Consultants Limited). An additional 44 claims were staked later in 1980 and also optioned to Arbor Resources Inc. In 1981, Arbor Resources entered into a joint venture agreement with Esso Resources Canada Limited.

Description:

The area is underlain by a sequence of Devonian and (?)Mississippian, green and maroon, basaltic and andesitic pillow lavas, pillow breccias and tuffs, intercalated with beds of pale green to maroon and grey-black, argillaceous and cherty, tuffaceous sedimentary rocks. These units have undergone low-grade regional metamorphism. Poorly exposed beds of massive pyrite with minor chalcopyrite, up to 1.5 m wide, were found in two creeks. Several gossan zones also contained pyrite with minor chalcopyrite and sphalerite.

Current Work and Results:

During the summer of 1981, geological mapping (1:2,500), horizontal loop EM, magnetometer and limited stream sediment geochemistry surveys and a diamond drilling program were carried out.

The horizontal loop EM survey covered 19 line km, while the magnetometer survey covered 18 line km. Five EM conductors were delineated, one related to the sulphide mineralization, one related to a gossan, and three along a trend suggesting a shear zone with mineralization. Only 11 stream sediment samples were collected.

Three diamond drill holes, totalling 329 m were completed. Intersections of 0.076% Cu, 0.15% Zn and 3.77 ppm Ag over 9.1 m and 0.141% Cu, 0.18% Zn and 4.2 ppm Ag over 33.5 m were reported. These holes were drilled to test the two types of pyritic mineralization found on the property, small conformable massive bodies and relatively larger disseminated and stockwork pyritic bodies.

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AURORA
Union Carbide
Canada Limited

Tungsten
105 H 15 (57,45,46)
(61°52'N, 128°53'W)

Reference: Archibald (1981).

Claims: AURORA 1-114

Source: Summary by P. Watson from assessment report 090890 by D. Archibald, D. James, J. Toohey and P.J. Doyle.

History:

A portion of the present claim block was staked in 1967 as the ZEUS claims (45) and the CHAP showings (46) were investigated by Spartan Exploration for skarn potential. Welcome North Mines Limited restaked the ZEUS claims as the ZEUT claims in the 1970's, but these were later dropped. Welcome North Mines Limited staked the AURORA claims in 1980 and optioned them to Union Carbide Exploration Corporation the same year. The block is located 35 km west-southwest of Tungsten, N.W.T.

Description:

Undifferentiated, weakly chloritized granodiorite of the Mount Billings Batholith underlies much of this area and has been dated by Archibald (1981) as 94.7 ± 1.6 Ma. The batholith has intruded Hadrynian slates, phyllites, siltstones, minor limestones and quartzites. A northwest-trending roof pendant of metasedimentary rocks occurs on the northern part of the claims and metasedimentary rocks also occur to the south.

Current Work and Results:

Welcome North found four zones of molybdenum and tungsten mineralization, associated with narrow quartz veinlets and fracture surfaces, in talus. In 1981, Union Carbide found no significant mineralization or stockwork development. In outcrops above the talus mineralization, only traces of scheelite and molybdenite were found, along chloritized fracture surfaces and vein margins.

In addition to 1:10,000 scale mapping carried out at this time, 113 talus grab, 120 soil and stream sediment and 59 pan concentrate samples were collected and analyzed for Cu, Mo, W and in some cases Ag. Anomalous results all related to known mineralization. Soil and stream sediment samples contained up to 225 ppm W and 22 ppm Mo.

******

FIN
Cominco Limited

Lead, Zinc, Barite
Stratabound
105 H 12 (59)
(61°40'N,129°50'W)

Reference: D.I.A.N.D. (1981, p. 188).

Claims: FIN (469)

Source: Summary by P. Watson from assessment report 090877 by T.W. Hodson.

Description:

The FIN claims were staked in 1978, 1979 and 1980. They are underlain, from southeast to northwest, by a carbonate reef complex and coarse shallow water clastics, deeper water finer sediments such as cherts, mudstones and siltstones, and another carbonate complex, indicating that the claims cover a basin between two carbonate complexes. This transitional zone is probably part of the Lower to Upper Devonian Road River Formation.

Lead-zinc mineralization is associated with carbonaceous mudstone and siltstone. In addition, the chert members contain mineralization, in the form of minor disseminated pyrite, pyrite and barite nodules, and barite lenses up to 15 cm by 3 m in size.

Current Work and Results:

Geological mapping and soil and rock geochemical surveys were conducted in 1981. A total of 859 soil, 36 stream sediment and 92 rock samples were collected and analyzed for Cu, Pb, Zn, Ag and Ba.

A large Pb-Zn anomaly outlined in the Yusezyu River Valley is explained by downstream transportation from the known mineralization on Fin Creek. A small, coincident Pb-Zn-Ag anomaly may represent the eastern edge of the FIN mineralization.

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HAWK
Cyprus Anvil Mining Corporation Limited;
A. Black

Tungsten
105 H 3 (60)
(61°01'N,129°02'W)

Claims: HAWK 1-4, 10, 12

Source: Summary by P. Watson from assessment report 090677 by G.A. Jilson.

History:

The area was first staked as the MR claims in 1965 by P. Risby. In 1977, the HAWK claims were staked by A. Black to cover concentrations of coarse scheelite and magnetite in a creek. Union Carbide Canada Limited optioned the claims in 1978 and concluded that the scheelite occurred in glacial till. Cyprus Anvil Mining Corporation Limited optioned the HAWK and staked the surrounding KLUNK claims (See Number 19, 105A) in 1980 to evaluate lead-zinc potential.

Description:

The area is underlain by Ordovician to Silurian Road River Formation black shales and limestone to the west, separated by a north-south fault from Cambrian to Ordovician calcareous phyllites of the Vangorda Formation. Overburden cover is extensive.

Current Work and Results:

In 1980, ground EM and soil geochemistry surveys were undertaken. The EM survey, totaling 4.5 line km, delineated the two rock units based on their typical EM response. A total of 4,000 soil samples were collected on the HAWK and KLUNK claims and analyzed for Pb, Zn and Cu. All samples collected on the HAWK claims contained background values only.

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TUNA
Union Carbide Exploration Corporation Limited

Tungsten
105 H 16 (68)
(61°49'N,128°14'W)

Claims: TUNA 1-180

Current Work and Results:

Scheelite mineralization occurs within a Cretaceous quartz monzonite intrusion, in association with pyritic quartz-tourmaline veins and breccia zones. Small garnet-pyroxene skarns are also developed along the intrusive contact.

In 1981, the claims were mapped at a scale of 1:10,000, and 210 soil and stream sediment samples and 50 lithogeochemical samples were collected.

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GEL
Patmar Resources Limited

Geophysical Target
105 H 1 (69)
(61°14'N,128°23'W)

Claims: GEL 1-16

Source: Summary by P. Watson from assessment report 090879 by D.W. Tully.

Description:

The GEL claims adjoin the SKULL group on which lead-zinc mineralization was discovered in 1965. They are underlain by Jurassic-Cretaceous granite and granodiorite intrusive rocks and black calcareous shale which may be Ordovician or Silurian. These claims are located west of km 78 on the Nahanni Range Road and are accessible from the Conglomerate Creek bush road.

Current Work and Results:

Magnetometer, VLF-EM and geochemical soil sampling surveys were undertaken in 1981. A total of 289 soil samples were collected and analyzed for Pb and Zn. Samples containing greater than 40 ppm Pb (4 samples) or 150 ppm Zn (7 samples) were considered anomalous. Three zones of approximately coincident anomalous magnetic, VLF-EM and geochemical responses were outlined.

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1981 MINERAL CLAIMS STAKED

MIDAS
Newline Resources Limited — 105 H 1 (2) (61°06'N,128°15'W)

Claims 1981: ZULU (12); ZEST (8)

JAN
Patmar Resources Limited;
Kinai Resources Corporation — 105 H 1 (1) (61°02'N,128°15'W)

Claims 1981: PATRICIA (18); PRINCESS (8)

CANYON
Kimberley Gold Limited;
Vancliff Resources — 105 H 1 (19) (61°12'N,128°22'W)

Claims 1981: SKULL (140)

ON
Zlato Resources Corporation;
Vancliff Resources — 105 H 2 (64) (61°14'N,128°40'W)

Claims 1981: ON (24)

KNEIL
Cyprus Anvil — 105 H 4 (65) (61°07'N,129°55'W)

Claims 1981: KNEIL (60)

TYER
A. Dick; A. Ceaser;
N. Hennil — 105 H 6 (66) (61°17'N,129°07'W)

Claims 1981: ANDREW (2); MUD; FROG; SANDY; TYER (7); BUSH (2); ALFRED (2); MOOSE (2); RAFT (2)

HELEN
Eclipse Mining Corporation;
Vancliff Resources — 105 H 7 (27) (61°29'N,128°36'W)

Claims 1981: HELEN (16)

RON
J.C. Turner — 105 H 7, 8 (26) (61°27'N,128°30'W)

Claims 1981: ANN (16); SHIRL (16)

TERRY
J.C. Turner;
Zlato Resources Corporation — 105 H 8 (21) (61°18'N,128°10'W)

Claims 1981: UNION (6)

RAIN
Waterloo Energy Corporation — 105 H 9 (29) (61°38'N,128°05'W)

Claims 1981: LIGHTENING (6)

LYNX
E. Brodhagen — 105 H 16 (67) (61°55'N,128°24'W)

Claims 1981: LYNX (2)

TUNA
Union Carbide Canada Limited — 105 H (68) (61°49'N,128°14'W)

Claims 1981: TUNA (180)

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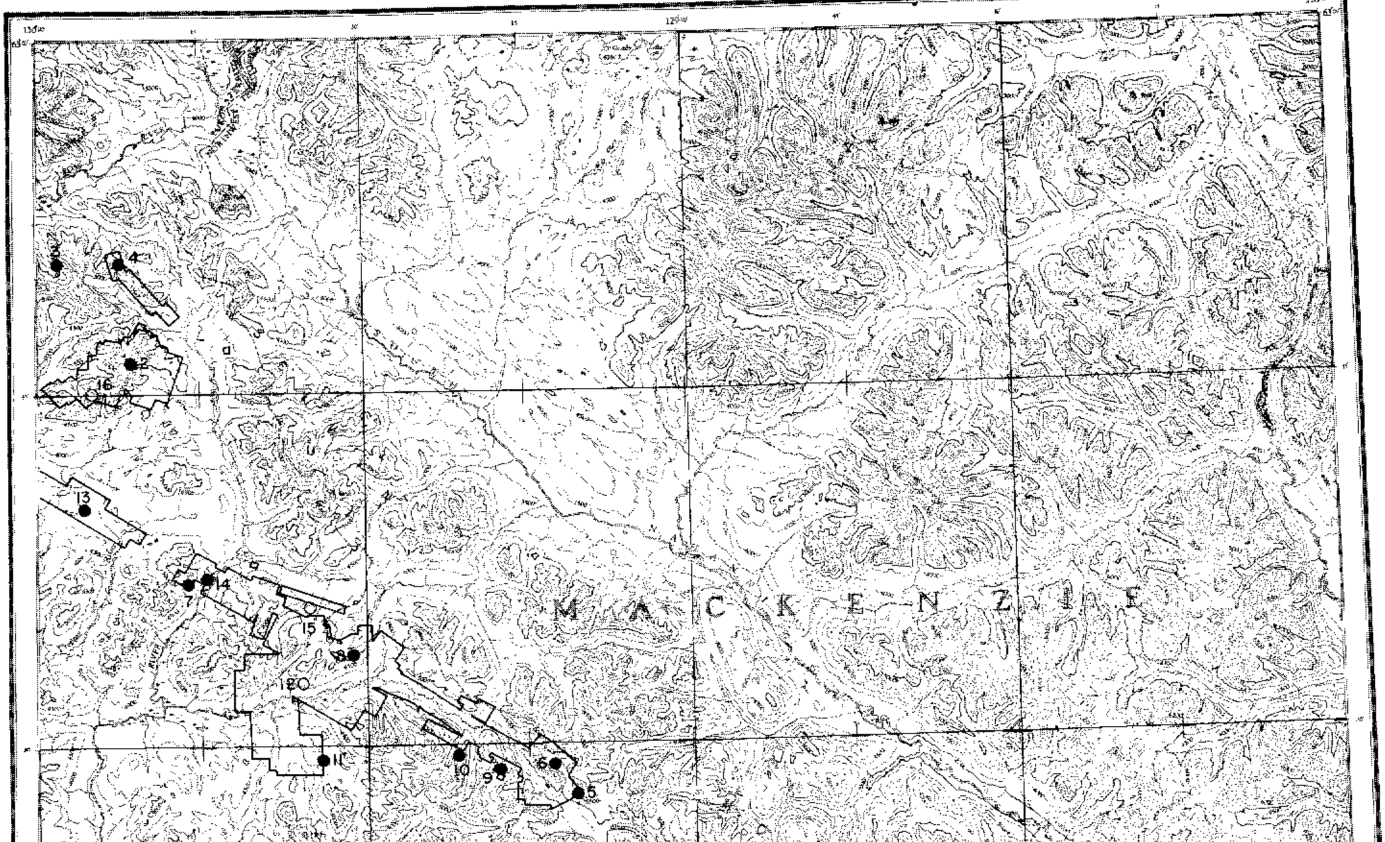
105 I



NAHANNI

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- ○72 .... Unmineralized Target
- ......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ......Mineral Claims staked in 1981
- ......Prospecting Leases in good standing (April 1982)
- ......Placer Claims in good standing (April 1982)
- CEL........Coal Exploration Licence
- CML........Coal Mining Lease
- ......Tote Trail
- ......Driveable Road
- ......Oil or Gas Well
- ......Airstrip

NAHANNI MAP-AREA (NTS 105 I)

General Reference: GSC Open File 780 and GSC Open File 809 by: S.P. Gordey, 1981

NO.	PROPERTY NAME	REFERENCE
1	NAR	Copper-Lead-Silver-Zinc Vein
2	OMO	This Report
3	BIR	Findlay (1969b, p. 50)
4	NOM	Sinclair et al (1975, p. 165-166); D.I.A.N.D. (1981, p. 191)
5	HOWARD'S PASS	MIR (N.W.T.), 1973; D.I.A.N.D. (1981, p. 7, 18)
6	SHIELD	Sinclair et al (1975, p. 160-161)
7	ORO	Sinclair & Gilbert (1975, p. 96-98)
8	WISE	Lead-Zinc-Silver Stratabound
9	WINKIE	Sinclair et al (1975, p. 161-162)
10	NESS	Sinclair & Gilbert (1975, p. 96-97)
11	DIANNE	Sinclair et al (1975, p. 165-166)
12	RITZ	D.I.A.N.D. (1981, p. 190)
13	ABBEY	D.I.A.N.D. (1981, p. 190)
14	TANG	Morin et al (1979, p. 92)
15	OHNO	Morin et al (1980, p. 69)
16	ROOK	Morin et al (1980, p. 70)

OMO
Placer Development Limited

Tungsten, Copper
Zinc Skarn
105 I 13 (2)
(62°46'N,129°52'W)

References: D.I.A.N.D. (1981, p. 190); Morin et al (1980, p. 70); Morin et al (1979, p. 92-93)

Claims: CLEA, OMO (182 total)

Source: Summary by P. Watson from assessment report 090880 by M.B. Gareau.

Current Work and Results:

Five BQ diamond drill holes were completed to a total depth of 1,616 m in 1981. These were located on CLEA 42, 103 and 101 Fr, and four of them reached quartz monzonite before terminating. Assays such as 0.46% WO_3 over 0.7 m and 0.19% WO_3 over 2.6 m were reported.

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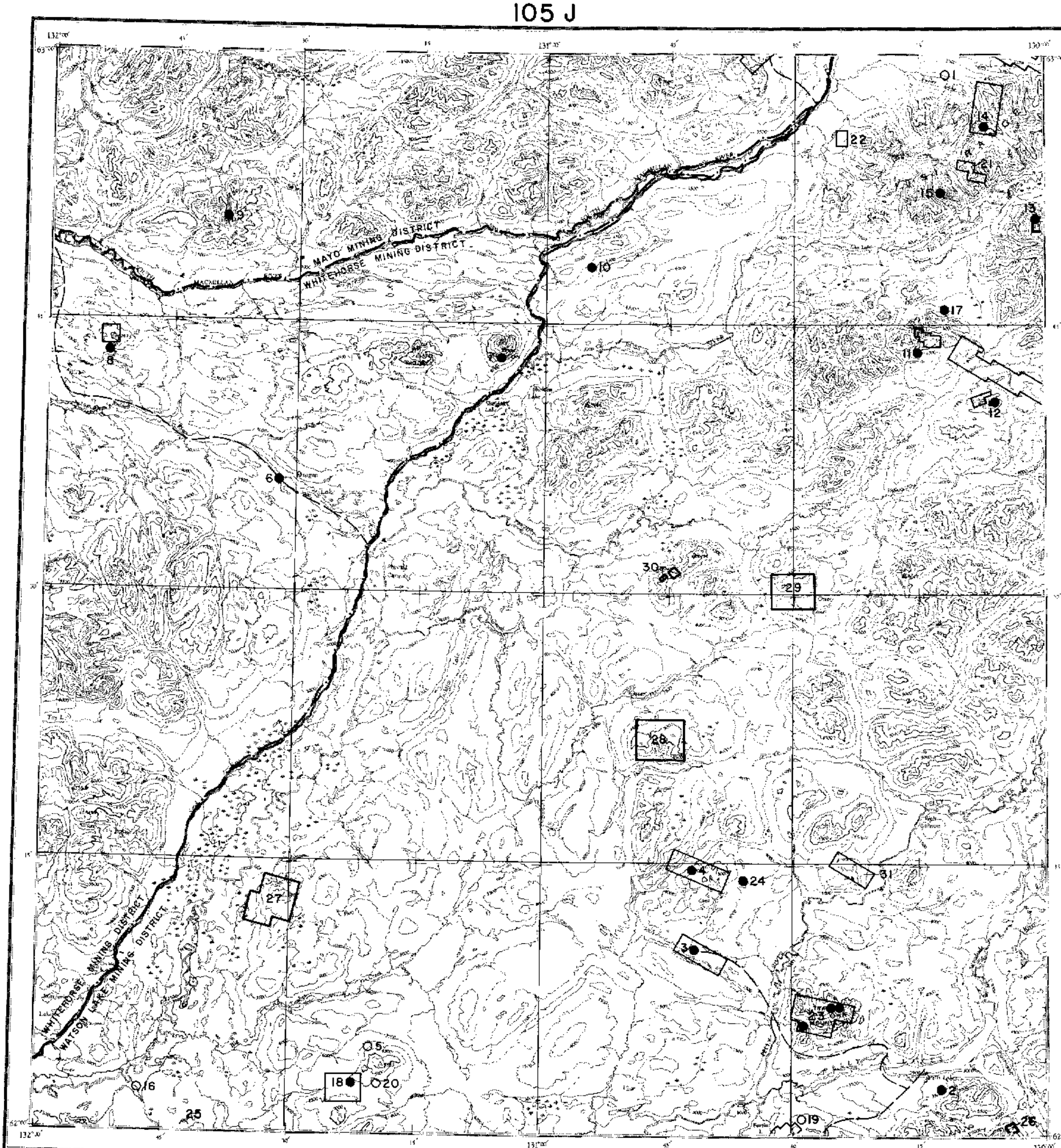

SHELDON LAKE

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page	.... Prospecting Leases in good standing (April 1982)	.... Tote Trail
○72 .... Unmineralized Target	.... Placer Claims in good standing (April 1982)	.... Driveable Road
.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL .... Coal Exploration Licence	.... Oil or Gas Well
...... Mineral Claims staked in 1981	CML .... Coal Mining Lease	.... Airstrip

SHELDON LAKE MAP-AREA (NTS 105 J)

General Reference: GSC Map 12-1961 by:
J.A. Roddick and L.H. Green, 1961.
GSC Open File 212 by:
D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	REFERENCE
1	FULLER	
2	BILL	Findlay (1969a, p. 81)
3	PIKE	This Report
4	NORKEN	Green & Godwin (1963, p. 30-31)
5	TAC	Copper-Molybdenum Porphyry
6	DRAGON	Skinner (1961, p. 43); D.I.A.N.D (1981, p. 195)
7	MT. SHELDON	Kindle (1945, p. 25)
8	RIDDELL	Craig & Milner (1975, p. 105-106)
9	SPEARHEAD	Craig & Milner (1975, p. 33)
10	ROG	Craig & Milner (1975, p. 123)
11	CLYDE	Craig & Laporte (1972, Vol. I, p. 128)
12	PREVOST	Sinclair & Gilbert (1975, p. 118-119); D.I.A.N.D. (1981, p. 195)
13	GUN	Findlay (1969b, p. 166-167); This Report
14	ITSI	D.I.A.N.D. (1981, p. 193)
15	COSTIN	Silver-Lead-Zinc Vein
16	CAROLYN	Coal
17	VARISCITE	Sinclair et al (1975, p. 166-167)
18	HENCH	D.I.A.N.D. (1981, p. 193)
19	PPR	D.I.A.N.D. (1981, p. 195)
20	CLINGON	D.I.A.N.D. (1981, p. 195)
21	WILSON	D.I.A.N.D. (1981, p. 194)
22	EMPTY	D.I.A.N.D. (1981, p. 194)
23	TRAFFIC	D.I.A.N.D. (1981, p. 194)
24	PIG	Morin et al (1979, p. 93)
25	BOJO	Morin et al (1980, p. 71)
26	LH	This Report
27	AM	This Report
28	SHERPA	This Report
29	DYAK	This Report
30	RUDY	This Report
31	GREGGIE	This Report

PIKE
Cima Resources Limited

Copper, Silver
105 J 2 (3)
(62°10'N,130°43'W)

References: Morin et al (1980, p. 70); Findlay (1969, p. 80)

Claims: PIKE

Source: Summary by P. Watson from assessment report 090902 by I. Vopel.

Current Work and Results:

The results from three widely spaced diamond drill holes were reported. The total depth drilled was 280.1 m, and the holes intersected impure limestone, shale and porphyritic granite with varying degrees of alteration and mineralization. Mineralization (pyrite, arsenopyrite, minor chalcopyrite) generally occurs in fractures in the porphyritic granite. Diamond drilling located in Zone #1 intersected mineralization averaging 0.513% Cu and 45.7 g Ag/t over 17.5 m.

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AM
S.M.D. Mining Company Limited

Copper, Molybdenum Porphyry
105 J 3, 4 (27)
(63°13'N,131°32'W)

Claims: AM 1-93

Current Work and Results:

Hybrid-type Cu-Mo-porphyry mineralization is located in hornfels peripheral to a Late Cretaceous granodiorite plug. Diopside skarns containing Pb-Zn-Ag mineralization have also developed close to the intrusion.

In 1981, 12 claims were mapped at a scale of 1:5,000, and 17 rock samples were collected and analyzed for Cu, Mo, Pb, Zn, Ag, Au, As and Sb. A total of 343 soil samples were collected on a grid in the same area and analyzed for Cu, Mo, Pb, Zn, Ag and Au. A 200 m by 800 m zone of weak chalcopyrite-molybdenite mineralization was identified in quartz-veined, hornfelsed, sedimentary rock around the southwest end of a small granodiorite plug. A soil geochemical poly-metallic anomalous zone was delineated in the area of known mineralization, extending to the north beyond known mineralized outcrop. Several galena, sphalerite and chalcopyrite-bearing diopside skarn outcrops were found on two of the claims, and a 100 m by 200 m breccia zone carrying the same minerals was found elsewhere on the property.

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SHERPA
Gulf Minerals Canada Limited

Geochemical Target
105 J 7 (28)
(62°23'N,130°50'W)

Claims: SHERPA 1-99

Source: Summary by P. Watson from assessment report 091000 by E.P. Dillon.

Description:

The claims were staked to cover an area with anomalous stream sediment samples collected during a 1980 reconnaissance program. They are underlain by Ordovician to Silurian chert and shale.

Current Work and Results:

During 1981, a total of 767 soil and 59 stream sediment samples were collected and analyzed for Pb, Zn, Ag, Ba and V. Threshold values for soil samples were calculated as 39 ppm Pb, 294 ppm Zn, 2.1 ppm Ag and 2,300 ppm Ba. A large coincident Pb-Zn-Ag-Ba anomaly was delineated on the property and stream sediment samples from the drainage of the anomalous soil area were also anomalous in Zn, Ag and Ba. Thresholds for stream sediment samples were calculated as 25 ppm Pb, 1,000 ppm Zn, 2.3 ppm Ag and 7,000 ppm Ba.

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DYAK
Gulf Minerals Canada Limited

Geochemical Target
105 J 7,8,9,10(29)
(62°30'N,130°30'W)

Claims: DYAK 1-80

Source: Summary by P. Watson from assessment report 091001 by E.P. Dillon.

Description:

The claims were staked to cover the possible source of stream sediment geochemical anomalies located during a 1980 reconnaissance program. They are underlain by Ordovician to Silurian chert and shale.

Current Work and Results:

In 1981, 588 soil and 97 stream sediment samples were collected and analyzed for Pb, Zn, Ag, Ba and V. Threshold values for soil samples were 36 ppm Pb, 240 ppm Zn, 2.5 ppm Ag and 2,200 ppm Ba. Scattered, spotty anomalous zones were located, with one coincident Pb-Zn-Ag-Ba anomaly on the property. Two silt samples contained anomalous Pb values.

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GREGGIE
Cyprus Anvil Mining Corporation

Geochemical Target
105 J 1,8 (31)
(62°14'N,130°25'W)

Claims: GREGGIE 1-40

Source: Summary by P. Watson from assessment report 090680 by G.A. Jilson.

History:

The GREGGIE claims were staked in September, 1979 following a regional geology and silt geochemistry program.

Description:

This lead-zinc geochemical prospect is located near the contact between Hadrynian to Lower Cambrian "grit unit" and lower Paleozoic formations. A Paleozoic or younger mafic intrusion is located southwest of the claim block.

Poorly sorted quartz and feldspar sandstones and maroon and green slates typical of the "grit unit" are found on the northeast part of the property. Overlying this to the south are thinly bedded phyllites and phyllitic siltstones, which are in turn overlain by phyllitic limestone and calcareous phyllite. Beyond the property boundaries, this unit is underlain by Road River Formation graptolitic shale and chert.

Current Work and Results:

In 1980, 10.9 km of linecutting and 32 line km of soil sampling were completed. Soil samples were collected from 327 locations and analyzed for Cu, Pb and

Zn. Mean and anomalous (mean + 2 standard deviations) values, in ppm, were as follows: copper, 24 and greater than 56; lead 29, and greater than 70; and Zn, 105 and greater than 214.

Lead anomalies were patchy and isolated. Copper values were barely anomalous (one station only), and zinc anomalies were generally weak. Lead anomalies were completely separate from zinc and copper anomalies, and no significant near-surface mineralization was indicated by this survey.

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1981 MINERAL CLAIMS STAKED

LH — 105 J 1 (26)
Gulf Minerals — (62°00'N,130°04'W)

Claims 1981: LH (4)

AM — 105 J 4 (27)
S.M.D. Mining Company Limited — (62°13'N,131°32'W)

Claims 1981: AM (93)

SHERPA — 105 J 7 (28)
Gulf Minerals — (62°22'N,130°46'W)

Claims 1981: SHERPA (99)

DYAK — 105 J 7,8,9,10 (29)
Gulf Minerals — (62°30'N, 130°30'W)

Claims 1981: DYAK (80)

RUDY — 105 J 10 (30)
A. Almond — (62°31'N,130°45'W)

Claims 1981: RUDY (4); TRUDY (2)

GUN — 105 J 16 (13)
D. Guest — (62°50'N,130°00'W)

Claims 1981: FAST (6)

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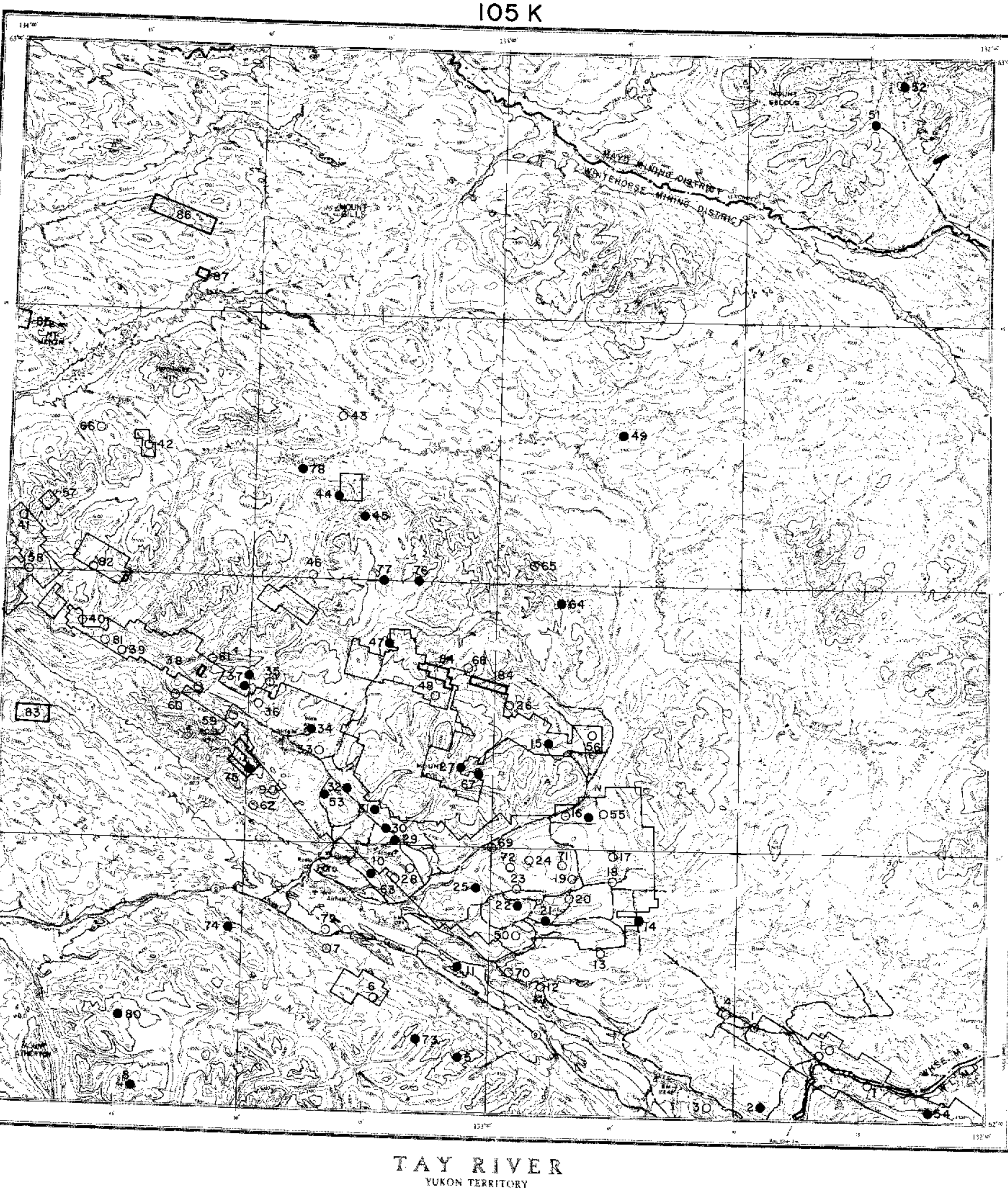
105 K



TAY RIVER
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page

○72 .... Unmineralized Target

...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

...... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

... Driveable Road

.... Oil or Gas Well

.... Airstrip

TAY RIVER MAP-AREA (NTS 105 K)

General Reference: GSC Map 13-1961 by: J.A. Roddick and L.H. Green, 1961.
GSC Open File 212 by: D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	REFERENCE
1	TENAS	This Report
2	RAGS	Johnston (1936, p. 18)
3	PEN	
4	OLGIE	
5	FARGO	Lead-Zinc Occurrence
6	LYN	D.I.A.N.D. (1981, p. 197)
7	CASCA	Sinclair et al (1975, p. 135-136)
8	THOMAS	Skarn Zinc Occurrence
9	TAKU	
10	NESBITT	Copper Occurrence
11	BOBCAT	Limestone Stratabound
12	HOLLY	
13	SOCK	Findlay (1967, p. 36); Tempelman-Kluit (1972)
14	SPUR	Findlay (1969a, p. 47-48)
15	ADAMSON	Tempelman-Kluit (1968, p. 43-52); Sinclair et al (1975, p. 132)
16	BETA	Green (1965, p. 36-37)
17	BLIND	Findlay (1967, p. 40-41); Sinclair & Gilbert (1975, p. 54)
18	CUB	Green (1965, p. 36-37)
19	NASTY	Green (1965, p. 36-37); Craig & Milner (1975, p. 92-93)
20	ABRAHAM	Craig & Milner (1975, p. 92-93)
21	SEA	Green (1965, p. 36-37); This Report
22	BS	Sinclair & Gilbert (1975, p. 58)
23	BLACKWOOD	Sinclair et al (1975, p. 135)
24	BEA	Findlay (1969a, p. 46-47)
25	SWIM	Tempelman-Kluit (1972, p. 42-43); Sinclair et al (1975, p. 134); This Report
26	O'CONNOR	Findlay (1967, p. 39-40)
27	MUR	Silver-Lead-Zinc Vein
28	SHRIMP	Green (1965, p. 37-38)
29	VANGORDA	Tempelman-Kluit (1972, p. 46-47)
30	GRUM	Sinclair et al (1975, p. 130-131)
31	KULAN	Tempelman-Kluit (1972, p. 32)
32	KIM	Findlay (1969a, p. 45)
33	LO	
34	FARO	Tempelman-Kluit (1972, p. 49-65); Sinclair et al (1975, p. 128-129); This Report
35	FLAGSTONE	
36	BRIDEN	Findlay (1969a, p. 45)
37	JACOLA	Silver-Lead-Zinc Vein
38	CROWN	This Report
39	LORNA	Sinclair & Gilbert (1975, p. 56-57)
40	RESERVE	Craig & Milner (1975, p. 98-99)
41	COWARD	Lead-Zinc Occurrence
42	COLT	Craig & Milner (1975, p. 99-100)
43	OWL	Craig & Laporte (1972, p. 93-94)
44	KEGLOVIC	Sinclair et al (1975, p. 133)
45	IVAN	Sinclair et al (1975, p. 133)
46	SHANNON	Findlay (1969a, p. 45)
47	REBEL	Craig & Milner (1975, p. 93-95)
48	KANGAROO	Sinclair et al (1975, p. 129)
49	TEDDY	Skarn Zinc Occurrence
50	SIROLA	
51	LAD	Silver-Lead-Zinc-Copper Vein
52	SOLO	Craig & Laporte (1972, p. 97-98)
53	CESSNA	
54	CHAPLIN	Sinclair et al (1975, p. 137)
55	RUTH	D.I.A.N.D. (1981, p. 198)
56	DOT	D.I.A.N.D. (1981, p. 198)
57	BRAB	This Report
58	FISHHOOK	D.I.A.N.D. (1981, p. 198); This Report
59	HEK	Sinclair et al (1976, p. 118)
60	MULTI	Sinclair et al (1976, p. 118 -119)
61	JOE	Sinclair et al (1976, p. 120)
62	TSS	Sinclair et al (1976, p. 120)
63	DG	Sinclair et al (1976, p. 121)
64	NORK	Sinclair et al (1976, p. 124)
65	ZED	Sinclair et al (1976, p. 124)
66	LOLO	Sinclair et al (1976, p. 126)
67	RAZ	Morin et al (1977, p. 160)
68	MING	Morin et al (1977, p. 161)
69	CAT	Morin et al (1980, p. 46)
71	MN	Morin et al (1979, p. 63)
72	RACHEL	Morin et al (1979, p. 64)
73	SIRJOHN A	Morin et al (1980, p. 41)
74	DEV	Morin et al (1980, p. 42)
75	URN	This Report
76	KD	Morin et al (1980, p. 45)
77	CON	Morin et al (1979, p. 68)
78	IRMA	Morin et al (1979, p. 68)
79	LOU	Morin et al (1980, p. 41)
80	MAY	Morin et al (1980, p. 42)
81	EVA	Morin et al (1980, p. 43)
82	LU	Morin et al (1980, p. 43-44)
83	DELAY	This Report
84	FOO	This Report
85	WAD	This Report
86	LADY DI	This Report
87	CHUCK	This Report

TENAS
Cyprus Anvil Mining Corporation Limited

105 K 1 (1)
(62°03'N,132°15'W)

Reference: D.I.A.N.D. (1981, p. 197).

Claims: TENAS 23

Source: Summary by P. Watson from assessment report 090898 by J.W. Mustard.

Current Work and Results:

Two holes were drilled in 1981 on the TENAS claims. They totalled 920.2 m of NQ diamond drilling and intersected variably calcareous, carbonaceous, chloritic, siliceous or graphitic phyllite, metabasite, biotite-muscovite-andalusite schist and quartz monzonite.

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ANVIL
Cyprus Anvil Mining Corporation Limited

Lead, Zinc, Silver
Stratabound
105 K 2, 3, 6, 7
(21,25,34)

Reference: D.I.A.N.D. (1981, p. 197).

Source: Summary by P. Watson from assessment reports 090644, 090752, 090763, 090764, 090765, 090795, 090946, 090947 and 090948 by J.W. Mustard, assessment reports 090749, 090753, 090754, 090844 and 090874 by B.V. Hall, and assessment report 090826 by D.S. Jennings.

Current Work and Results:

Diamond drilling was carried out on claims in 105 K 2, 3, 6 and 7 in 1980 and 1981.

On 105 K 2, 493.5 m were drilled in one hole on PEA 1 to investigate the stratigraphy of the area. The hole intersected interbanded units of calcareous muscovite-chlorite phyllite, calcareous chloritic phyllite, graphitic phyllite and non-calcareous, muscovite-chlorite phyllite, bottoming in the latter. Units vary from 4 m to 133 m in thickness. No mineralization was reported. One NQ diamond drill hole was completed to 433.7 m on the SEA 12 (21) claim to test for a possible extension of the SB deposit. Non-calcareous, muscovite-chlorite phyllite and marble were encountered. In 1980, one NQ diamond drill hole was completed to 780.0 m on the LEA 16 claim, and intersected various phyllites, metabasite, marble and a diorite dyke. One NQ hole was also drilled to 894.8 m on the B.P. 1 claim. Muscovite-chlorite-quartz-pyrrhotite phyllite alteration overprinting, over 2 to 6 m, was intersected several times in this hole.

On 105 K 3, one hole was drilled on DY 183 and one on DY 144 to 1,009.1 m and 921.9 m respectively. In the first hole, an 8.7 m section of pyritic quartzite interbanded with graphitic phyllite, contained massive pyrite and baritic pyritic sulphide facies, but combined lead-zinc values were generally low. The hole on DY 144 intersected various types of mineralization, including pyrrhotite massive sulphides, magnetite-sphalerite-galena massive sulphides, sphalerite-galena-bar-

SUMMARY OF OPERATIONS OF
CYPRUS ANVIL MINING CORPORATION LTD.

Anvil Mine:	1978	1979	1980	1981
Tonnes Waste Mined	20,070,405	15,267,893	18,101,034	21,908,114
Tonnes Ore Mined	3,052,695	3,013,160	2,780,085	3,018,851
Tonnes Milled	3,280,000	2,823,827	2,825,108	2,758,603
Daily Average Milled (tonnes)	9,426	8,129	7,723	7,635
Mill Heads:				
Lead (%)	3.2	3.3	3.0	2.9
Zinc (%)	5.1	5.3	4.5	4.8
(gm/tonne)	34.3	-	42.5	41.7
Metal Production:				
Lead (kg)	87,849,327	77,017,788	67,941,825	61,528,345
Zinc (kg)	136,348,310	119,911,944	97,522,844	89,224,490
Silver (gm)	66,262,546	41,009,473	71,128,673	55,864,281
Gold (gm)	111,255	30,402	222,111	160,401
Metal Sales:				
Revenue from Shipments (000's $)	140,221	209,499	199,718	157,000
Ore Reserves at Year End:				
Tonnes (000,000's)	34.2	32.0	27.3	34.1
Lead (%)	3.0	3.1	2.9	3.0
Zinc (%)	5.6	4.8	4.4	4.6
Silver (gm/tonne) (approximate)	40.0	37.0	35.0	35.3

1979 figures adjusted for 29 days' work stoppage.

itic massive sulphides, pyrite massive sulphides, sphalerite-galena-chalcopyrite-bearing quartzites and sphalerite-galena ribbon-banded graphitic quartzites. Also on 105 K 3, an 803.7 m deep hole was drilled on GALE 13 in 1980. A 0.8 m section of massive pyrite and a 1.0 m section of base-metal bearing massive pyrrhotite were encountered. An 828.1 m deep hole drilled on GALE 46 intersected various bands of baritic massive sulphides, base-metal bearing pyritic quartzite and ribbon-banded sulphide-bearing graphitic quartzite, up to 2 m in thickness. In 1980, a 762.6 m deep hole was drilled on SWIM 10 (25). No mineralization was reported.

On 105 K 6, three holes were drilled in 1980: 481.3 m on MX 184, 873.4 m on FARO 105 (34) and 615.1 m on GAL 62. All three were drilled to test stratigraphy and structure, and in the case of MX, to test a linear geochemical anomaly. No mineralization was reported for these holes.

On 105 K 7, an 825.9 m hole was completed on JANICE 8, and a 648.3 m hole was completed on KIT 117, both in 1980. Again, they tested stratigraphy and structure, and no mineralization was reported.

1981 Reserves: Other Deposits

	Tonnes	%Pb	%Zn	gm/tonne Ag
Firth-Grum	30,781,000	3.1	4.9	49
Vangorda	4,950,000	3.3	4.3	48
Swim	4,750,000	3.8	4.7	42
Dy	20,267,000	5.7	7.0	82

Coal Division:	1978	1979	1980	1981
Waste Mined (tonnes)	-	373,294	83,080	-
Coal Produced	26,000	25,356	11,634	-

Underground workings closed May 29, 1978 due to spontaneous heating taking place in old workings. The mine was sealed off.

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CROWN
M.P.H. Consulting Limited

Geophysical Target
105 K 5 (38)
(62°23'N,133°34'W)

Claims: FU 1-20

Source: Summary by P. Watson from assessment report 090904 by P. Norgaard.

Current Work and Results:

In 1981, 12.3 line km of airborne EM and magnetic surveys were flown. Three responses of low priority were noted. The area is fairly resistive, and the general magnetic trend is north-south.

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BRAB
Union Oil of Canada Limited

Copper, Zinc, Silver, Tungsten
Skarn
105 K 12 (57)
(62°34'N,133°55'W)

Claims: BARB 1-9

Source: Summary by P. Watson from assessment report 090831 by W.C. Brereton.

Description:

The BARB claims were staked in 1980 to cover Zn, Cu, Ag and W mineralization in float and outcrop. A series of thin (less than 2 m) skarn beds occur in the limy to pelitic sediments of the Upper Vangorda Formation (lower Paleozoic) rocks within the contact metamorphic aureole of the Cretaceous quartz monzonite Anvil Batholith.

Current Work and Results:

In 1980, a reconnaissance geological and geochemical program was conducted on the property. Twenty-four grab rock samples from skarn outcrop and float were assayed for Cu, Pb, Zn, Ag, Au, W and Sn. Eight continuous chip samples across skarn bands were assayed for Mo and Fe, in addition to the above. Six stream sediment samples were analyzed for Cu, Pb, Zn, Ag and W.

At least five individual skarn bands were identified, generally discontinuous along strike. Although grab samples assayed as high as 3.5% Cu, 5.35% Zn, 150 g Ag/t and 0.40% WO_3, chip samples across the skarn bands contain very low average values. Pyrrhotite, pyrite, chalcopyrite, sphalerite, arsenopyrite and molybdenite locally comprise up to 25% of the skarn bands but generally average 3-5% over the total width of the bands. Minor scheelite was also noted.

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FISHHOOK
Union Oil Company of Canada Limited

Unmineralized Target
105 K 12,
105 L 9 (58)
(62°30'N,134°00'W)

References: D.I.A.N.D. (1981, p. 198); Morin et al (1980, p. 44); Morin et al (1979, p. 68-69)

Claims: TAY, AM

Source: Summary by P. Watson from assessment report 090825 by R. Zinn and W. Brereton.

Current Work and Results:

Nine diamond drill holes were completed for a total of 1,391.7 m to test geophysical targets. Graphitic quartzite, argillite, schist, limestone or phyllite units were found in six of the holes and are believed to be the conductors indicated. Various sericitic, quartzitic and chloritic phyllites, sericitic and quartz-biotite-andalusite schists and impure limestone units were intersected. Samples were analyzed for Cu, Pb, Zn, Ag and Au with no values greater than 3,400 ppm Cu, 1,700 ppm Pb, 2,900 ppm Zn, 2.8 ppm Ag or 105 ppb Au.

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LADY DI — Silver, Lead, Zinc
Welcome North Mines Limited — Massive Sulphide
105 K 13 (86)
(62°50'N,133°40'W)

Claims: LADY DI (60)

Current Work and Results:

Massive sulphide mineralization is found in a subhorizontal unit overlain by Mississippian Kalzas limestone and underlain by Earn Group siltstone.

During 1981, the claims were mapped at a scale of 1:10,000 and soil sampled at 200 m by 50 m intervals. Soil and stream sediment samples were analyzed for Cu, Pb and Zn. Two magnetometer profile lines and 20 m of trenching on the Main Showing were also completed. The pyrrhotite-sphalerite-galena, silver-bearing massive sulphides are exposed over a distance of 200 m, up to a thickness of 3 m.

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1981 MINERAL CLAIMS STAKED

DELAY — 105 K 5 (83)
Amax of Canada Limited — (62°22'N,133°57'W)

Claims 1981: DELAY (32)

CROWN — 105 K 5 (38)
Getty Metals — (62°24'N,133°36'W)

Claims 1981: FU (2)

URN — 105 K 5,6 (75)
Cyprus Anvil — (62°19'N,133°30'W)

Claims 1981: BERT (6); AND (8); URNIE (6)

FOO — 105 K 6 (84)
G. Clark et al — (62°24'N,133°05'W)

Claims 1981: FOO (33)

WAD — 105 K 12 (85)
Anaconda — (62°44'N,134°00'W)

Claims 1981: WAD (16)

LADY DI — 105 K 13 (86)
Welcome North Mines Limited — (62°50'N,133°40'W)

Claims 1981: LADY DI (60)

CHUCK — 105 K 13 (87)
Welcome North Mines Limited — (62°47'N,133°37'W)

Claims 1981: CHUCK (6)

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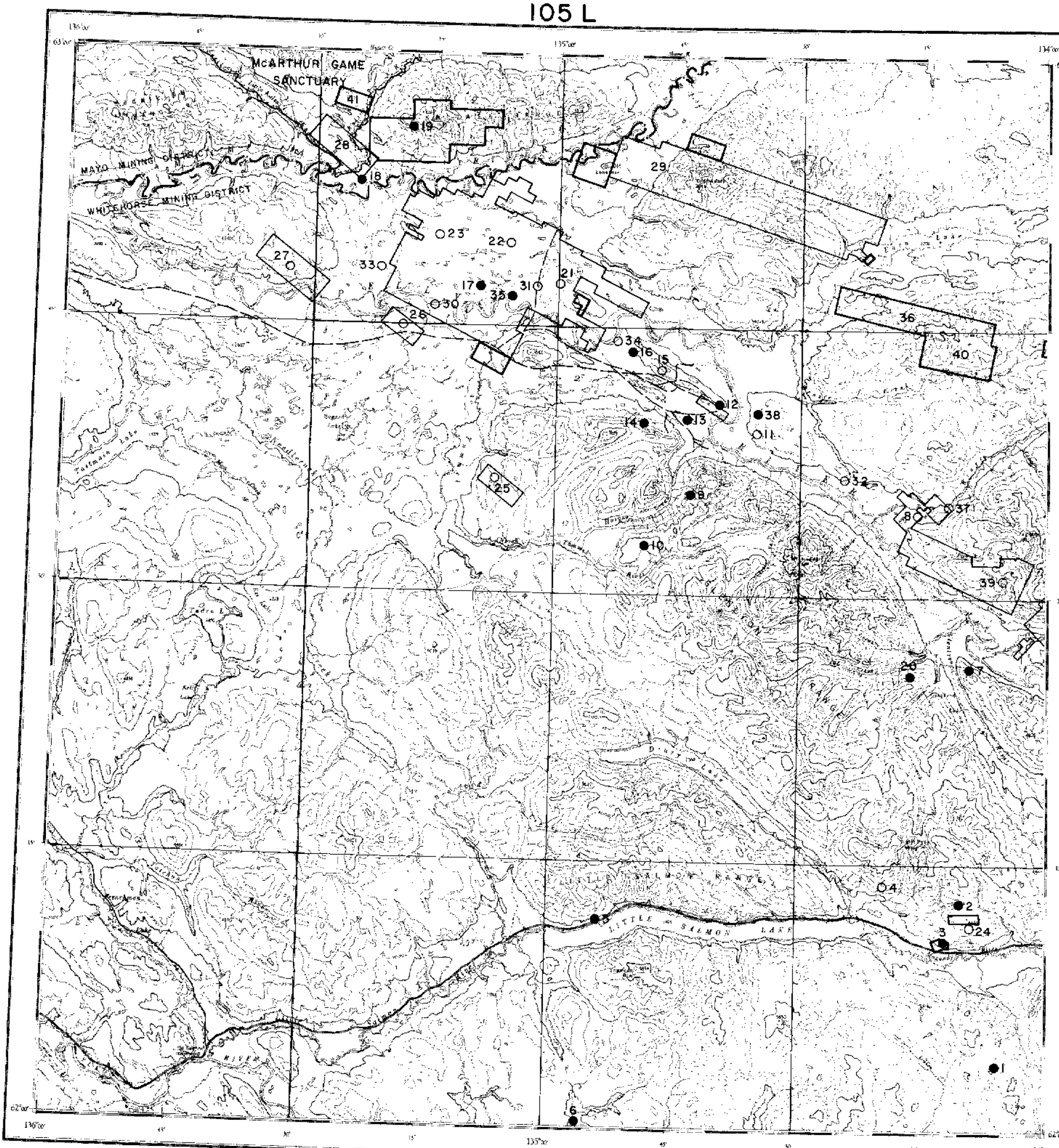
105 L



GLENLYON
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- O72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ..... Mineral Claims staked in 1981
- ..... Prospecting Leases in good standing (April 1982)
- ..... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- .... Tote Trail
- ..... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

GLENLYON MAP-AREA (NTS 105 L)

General Reference: GSC Map 1221A and Memoir 352 by: R.B. Campbell, 1967.

NO.	PROPERTY NAME	REFERENCE
1	LOKKEN	Skarn Zinc
2	LITTLE SALMON	Green (1965, p. 38-40)
3	MOULE	Campbell (1967, p. 81); This Report
4	TRUITT	
5	BRANDY	Campbell (1967, p. 81)
6	JUMPONT	Craig & Laporte (1972, p. 156)
7	GLENLYON LAKE	Copper-Lead Vein
8	HODDER	
9	HARVEY	Johnston (1936, p. 18)
10	TUMMEL	Campbell (1967, p. 81)
11	MUIR	D.I.A.N.D. (1981, p. 200)
12	HUB	Findlay (1969b, p. 28-29)
13	SEARFOSS	Findlay (1969b, p. 28-29)
14	FRONT	Copper-Silver Vein
15	GE	D.I.A.N.D. (1981, p. 200)
16	McCOWAN	Findlay (1969b, p. 28-29)
17	CLEAR LAKE	This Report
18	DUO	Coal
19	McARTHUR	Molybdenum-Copper-Tungsten Occurrence; This Report
20	FELIX	Skarn Zinc
21	KELLY	
22	TREDGER	
23	CONWEST	
24	DRURY	D.I.A.N.D. (1981, p. 203)
25	PETER	D.I.A.N.D. (1981, p. 201)
26	GRAF	D.I.A.N.D. (1981, p. 201)
27	HUGH	D.I.A.N.D. (1981, p. 201)
28	HANK	D.I.A.N.D. (1981, p. 201-202)
29	ONE HUMP	This Report
30	TUM	D.I.A.N.D. (1981, p. 202); This Report
31	PELLY	D.I.A.N.D. (1981, p. 202)
32	SAP	D.I.A.N.D. (1981, p. 202)
33	RSVP	D.I.A.N.D. (1981, p. 202)
34	WHIP	D.I.A.N.D. (1981, p. 202)
35	HACHEY	Lead-Zinc-Copper
36	JAR	This Report
37	LOBO	Sinclair et al (1976, p. 127)
38	END	Sinclair et al (1976, p. 128)
39	AM-PM	Morin et al (1980, p. 45)
40	RABBIT	This Report
41	BUM	This Report

CLEAR LAKE
Getty Canadian Metals Limited;
Essex Minerals Company Limited

Lead, Zinc, Silver
Stratiform
105 L 10,14,15 (17)
(62° 49'N,135° 05'W)

References: D.I.A.N.D. (1981, p. 200-201, 203); Morin (1981, in D.I.A.N.D. 1981, p. 85-87); Morin et al (1980, p. 45-46); Morin et al (1977, p. 164); Sinclair et al (1976, p. 129); Findlay (1967, p. 34).

Claims: SUE (in excess of 1,000 claims); GET B (9); GET C (14)

Source: Summary by P. Watson from assessment report 090659 by G.R. Kent, assessment reports 090851, 090852, 090853 and 090859 by C.W. Payne and assessment report 090932 by C.G. Verley.

Description:

Rocks on the property are cut by the Tintina Fault. The northern block is underlain by volcanic and minor sedimentary rocks of the Ordovician Anvil Range Group, while the southern block is underlain by clastic and carbonate sedimentary rocks of Devono-Mississippian age.

Current Work and Results:

In 1980, gravity and MAX-MIN electromagnetic surveys were conducted on ground east and west of the massive sulphide deposit and on part of the SUE claims as a follow-up to 1978 airborne EM surveys. EM was used mainly to pinpoint the anomalies located by the airborne surveys, and the gravity survey was used to resolve the significance of EM conductors. A total of 23 anomalies were defined.

In 1981, work was carried out on three grids as a follow-up to previous work. A MAX-MIN EM survey on the first of these defined a 915 m long conductor open to the east and west and believed to be caused by underlying graphitic phyllite. A total of 88 soil samples were analyzed for lead, zinc and silver. Samples were considered anomalous if they contained greater than 0.5 ppm Ag, 154 ppm Zn or 29 ppm Pb. Five samples contained anomalous Ag and formed an anomaly along with two of the three anomalous Zn samples. The three anomalous Pb samples were spatially unrelated to Ag and Zn values.

A second grid was evaluated using MAX-MIN EM, soil geochemistry, and proton magnetometer surveys. The MAX-MIN EM survey defined two parallel conductors 600 m in length and open to the east. Pb, Zn and Ag values were determined for 104 soil samples, but only isolated one-sample anomalies were indicated. The magnetometer survey outlined a southwest-trending, 915 m long, 150-275 m wide anomaly, believed to be caused by the underlying intermediate to mafic volcanic rocks.

A third grid was soil sampled to follow-up a 128 ppm Pb lake sediment sample anomaly. One hundred and five soil samples were analyzed for lead, zinc and silver and two small anomalies outlined. Soils containing greater than 24 ppm Pb, 175 ppm Zn or 0.4 ppm Ag were considered anomalous.

Also in 1981, three NQ diamond drill holes were completed for a total of 709.3 m. Disseminated and massive pyrite were reported, with a 1.8 m wide band of massive pyrite assaying 0.05% Zn, 0.01% Pb and 1.3 g Ag/t.

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ONE HUMP
Anaconda Canada Exploration Limited

Copper, Tungsten
Skarn
105 L 15, 16 (29)
(62°53'N,134°43'W)

References: Campbell (1967); Gordey et al (1981); Tempelman-Kluit (1977).

Claims: ACE 1-724, EARN 1-4

Source: Summary by D. Tempelman-Kluit based on property visit and by P. Watson from assessment report 090888 by G.G. Carlson.

Introduction:

The 1-724 ACE claims and 1-4 EARN claims were staked in the fall of 1980 and in early 1981 to cover massive sulphide showings on Dromedary Mountain found during regional reconnaissance. D. Tempelman-Kluit visited the property for a week in early July, 1981 and was guided on the showings and elsewhere by G. Carlson, geologist for Anaconda. Tempelman-Kluit mapped the claims and examined the showings during his visit, and this is a report of the results.

Geology:

A moderately southwest dipping succession of Paleozoic strata, underlies the claims. These strata are cut by northwest-trending normal faults, and they are intruded by subvolcanic plugs and necks of andesite that are probably Cretaceous. Near these plugs the rocks are hornfelsed and baked, and lenses of pyrrhotite with sulphide occur in the hornfels. The area was mapped by Campbell (1967), who named and defined many of the rock units. When that work was done, little was known of the regional stratigraphy and lateral variation of strata; the present study places this early work in the context of later findings and refines some of Campbell's assignments.

Road River Group (ODt)

Between Macmillan River and Earn Lake are two northwest-trending fault blocks which repeat essentially the same succession. The sedimentary rocks are separated into five units of which the oldest are thin- to medium-bedded greenish and pale grey chert (Odtsl). The chert is homogeneous with little variation, but it includes thin slate partings and laminae. The chert is intricately folded in some outcrops, but bedding generally dips southwest and the unit youngs in that direction; penetrative structures such as slaty cleavage are lacking. Between 500 and 1,000 m of these strata are estimated in the northeastern fault block. The chert lacks fossils and is correlated with the Road River Group on lithology and stratigraphic position and its age is presumed to be Ordovician to Devonian. The unit probably includes most of the strata of Gordey's (1981) Road River Formation, Orange Mudstone Member and Siliceous Shale as illustrated in section D of his Figure 2 (p. 396).

In the northeastern fault panel the chert is unmetamorphosed, but in the southwest block the unit is baked to a banded, light coloured, cherty hornfels (ODhf). Pale grey to light mauve coloured laminae a few centimetres thick alternate with dark brown layers of similar thickness. The hornfelsed chert (ODhf) looks unlike its unmetamorphosed counterpart; although much of it is cherty, the bulk of the unit weathers to darker colours than the chert and is more resistant and has rusty gossans in places. Hornfelsed chert also underlies the area between Earn Lake and Menzie Creek. The hornfelsed chert is recrystallized and locally sugary so that the rocks resemble very fine-grained quartzite. Quartz makes up most of the material in the light grey laminae and very fine-grained biotite is developed in the darker layers. The argillaceous laminae are discontinuous, suggesting that the conversion to biotite was incomplete. Fine-grained pyrrhotite is disseminated through the rocks and follows tiny fractures.

A calcareous part of the unit, perhaps the equivalent of Gordey's (1981) Orange Wispy Mudstone, is converted to fine-grained dark green, brown and white banded skarn. Green laminae contain epidote and actinolite, brown layers include finely divided grossularite and white layers are of quartz, calcite and tremolite. This skarn also has disseminated pyrrhotite with minor chalcopyrite. The white laminae tend to be sugary textured and coarser-grained than the darker layers.

Campbell (1967) included the chert in his unit 10, and he mapped the hornfelsed chert as unit 13. These two units are the lowest and highest formations of the Earn Group as he defined it. Both units are best considered equivalent to the Road River Group.

Crystal Peak Formation (DMcp)

Above the chert in the northeastern fault panel is black siliceous slate estimated to be about 100 m thick. It is overlain by chert granule grit and conglomerate. This conglomerate, the Crystal Peak Formation of Campbell (1967), is thick-bedded and resistant. It weathers white or light grey. Grains range to several cm across and are subangular to subrounded with low sphericity. The grit and conglomerate varies from grain-supported to matrix-supported varieties. Chert grains are mostly light grey to white, but some pale green and buff coloured grains are present. Granules of glassy quartz make up about ten percent of the rock by volume. The conglomerate and sandstone are well indurated and cemented by silica, and the rock breaks cleanly across clasts. Some conglomerate beds are graded and parallel bedded, but most beds are massive and lack layering or crossbedding. The chert grit and conglomerate forms thick lenses that interfinger with the shale at the base. The conglomerate may be submarine fan deposits. The Crystal Peak Formation is estimated to be about 1,000 m thick on Crystal Peak. Northwestward in the same belt it thins to nearer 500 m.

The age of the conglomerate is given by two limestones which bracket it (Campbell 1967, p. 55, 56), the fossiliferous Kalzas Formation which is Osagian - late Lower Mississippian - overlies the conglomerate and a thin limestone below the conglomerate is the same age. Campbell (1967) was unsure whether the thin limestone below the conglomerate is stratigraphically continuous with, or faulted against the conglomerate. Tempelman-Kluit examined the exposures and agrees with Campbell's conclusion that the lower limestone is not faulted. The Crystal Peak Formation is Osagian.

In the southwestern fault panel hornfelsed black chert and quartz granule grit, conglomerate and slate overlie the hornfelsed chert. These clastic rocks are much darker coloured than the Crystal Peak Formation in the northeastern panel. The conglomerate is made up of subangular, black and dark grey chert grains up to 10 cm across (mostly less than 5 mm) with about 15% black glassy quartz grains in a silica cemented sandy matrix of chert and quartz grains that is also dark grey. Dark grey sandstone with chert and quartz particles predominates over the conglomerate. Bedding is well defined and beds are generally thick. Slaty partings are common. Black slate, about 100 m thick, occurs at the base of the unit. The rocks are baked like the chert on which they rest and this has emphasized their dark colour: andalusite is developed in the dark slaty beds. The unit is between 500 m and 1,000 m thick on the south side of Dromedary Mountain.

The black chert grain unit is in the same stratigraphic position as the Crystal Peak Formation and resembles that unit except for its darker colour. The dark chert conglomerate is lithologically the same as the "Black Clastic", an informally named Devono-Mississippian unit of eastern Yukon. The unit was included in Campbell's (1967) unit 13, but it is here considered equivalent to the Crystal Peak Formation. The light colour of the Crystal Peak Formation on Crystal Peak may reflect the originally lighter colour of clasts there. Alternately, it may be that the rocks are hydrothermally leached near Crystal Peak because along trend to the west these same strata are darker.

Kalzas Formation (Mk)

A light grey weathering resistant, medium-grey fetid limestone, the Kalzas Formation, overlies the Crystal Peak Formation in the northeastern fault panel and is exposed south of Earn Lake. The limestone is a thick-bedded biosparite made up of crinoidal debris that may represent chenier deposits or crinoid debris flows. Locally the limestone contains sand-sized grains of quartz and chert and elsewhere the limestone is argillaceous and thin-bedded. Locally the unit is 50 to 100 m thick, but it is laterally discontinuous and commonly missing. The Kalzas Formation is fossiliferous and has been assigned to the Osagian (late Lower Mississippian) (Campbell, 1967).

Greenish Cherty Shale (Mt)

Siliceous dark grey slate and argillaceous chert overlies the Kalzas Formation in the northeastern fault panel, and about 500 m of strata are estimated. Much of the slate weathers to dull rusty orange colours, and the rocks are fairly recessive. Distinctive in the unit are grey-greenish cherty slate or tuff and greenish tuffaceous chert, but this makes up less than a quarter of the rock seen. The rocks are more argillaceous and generally darker grey than the chert of the Road River Group. No fossils were found in the slate, but stratigraphic position indicates the rocks are Mississippian or younger. The slate is lithologically like unit Mt and Mvt of the Pelly Mountains (Tempelman-Kluit 1977).

Because it also has the same stratigraphic relations the slates are considered equivalents of that unit.

Siltstone and Shale (Csl)

Medium- to thin-bedded dark brown shale with interbedded yellowish brown siltstone overlies the cherty slate and is well exposed along the lower part of Dromedary Creek and on the peninsula near the mouth of that stream. The rocks range from shale to fine -grained sand and are less indurated than the other strata; they weather recessively. The rocks are bioturbated and lamination is disrupted by horizontal burrows. Cross-lamination is common in the silty layers. The unit was probably deposited under shallow marine conditions.

The siltstone-shale unit is probably Carboniferous. No fossils were discovered in these strata, but they lie stratigraphically above the greenish cherty slate, and they are lithologically like unit Csl of the Pelly Mountains (Tempelman-Kluit 1977). Campbell (1967) included this unit with other strata in his unit 13.

South Fork Volcanics (Ksf)

Resistant, grey weathering plugs of massive fine -grained intermediate volcanic rocks of the informally named South Fork Volcanics intrude the older strata. The rocks are medium greenish grey on fresh surfaces and are hornblende andesine porphyry with an aphanitic altered saussuritized groundmass. Phenocrysts of plagioclase are subhedral and less than 1/2 mm across and hornblende occurs as chloritized acicular dark needles. The rocks are massive, generally homogenous, and appear to be remnants of subvolcanic necks or plugs. Extrusive equivalents were not seen. The massive porphyry is equivalent to Campbell's (1967) unit 21, but is more extensive than mapped by him.

Mineralization

On the west slope of Dromedary Mountain, about 200 m in elevation below the peak, is a prominent rusty gossan developed over an irregular lens of massive sulphide. The lens is well exposed in a narrow gully. It is about 5 m long and about 2 m across with gradational to sharp boundaries with unmineralized rock. Mineralization consists of massive, fine-grained pyrrhotite with sphalerite and chalcopyrite; minor scheelite is known. The rocks are coated with limonite, and talus cemented by limonite is present locally. Two or three lenses of similar sulphides, smaller than the main lens occur within 100 m of the larger lens. The sulphides are replacements of skarn developed in a limy part of the hornfelsed chert sequence, possibly equivalent to the Orange Mudstone in the Road River Group.

Elsewhere on the property, in strata on trend with the showing, wisps of very fine-grained pyrrhotite locally with chalcopyrite and/or scheelite are developed in the hornfelsed chert. Individual wisps are perhaps a millimetre to a centimetre thick, several centimetres long and developed parallel to the bedding.

The sulphides are skarns produced by thermal metamorphism of the cherty strata. Whether the mineralization was introduced late or whether it represents recrystallized and remobilized original metallic concentrations in the rocks is uncertain. The large lenses are probably mobilized concentrations, but the small wisps of disseminated pyrrhotite are probably metamorphosed in place. The rocks are considered promising because they contain sulphides in strata that are roughly time equivalent, though of different facies, to known sulphide occurrences in the Anvil District.

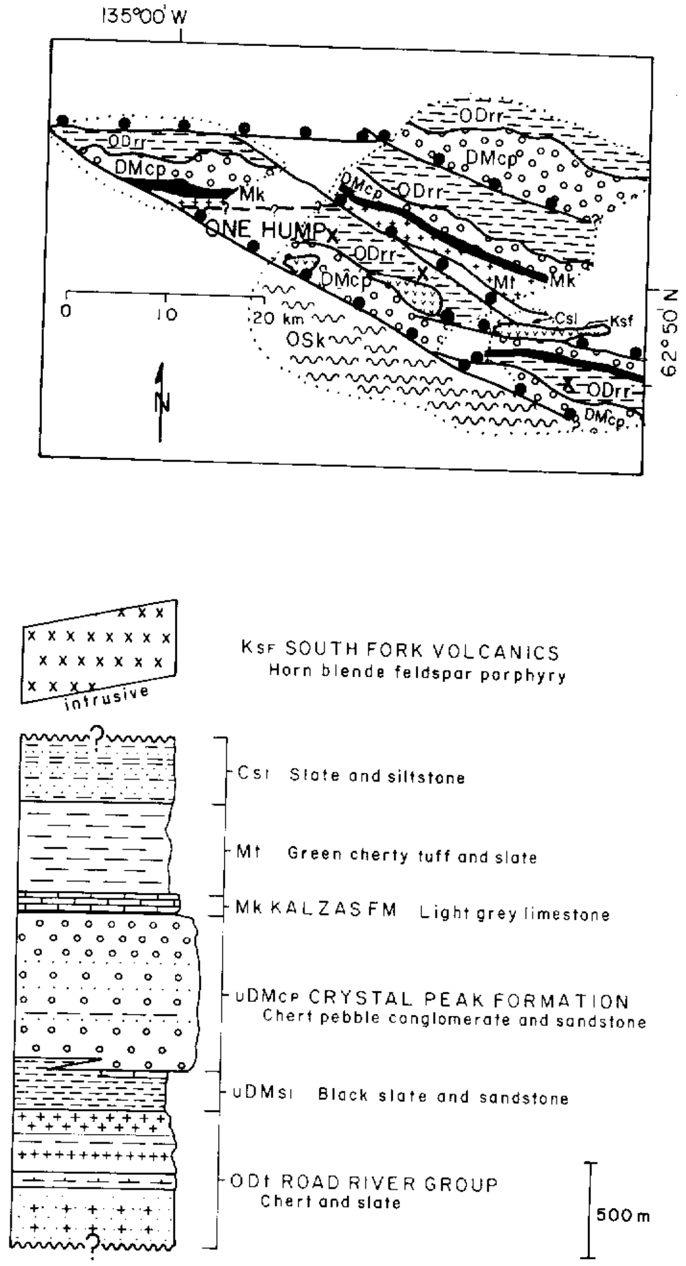

Figure 1. Geology and columnar section of strata exposed on Dromedary Mountain, Crystal Peak and the general area northwest of Earn Lake.

Current Work and Results:

In 1981, an area of 84.8 km by 7.2 to 16.8 km, centered on the ACE claims, was covered with an airborne EM and magnetometer survey, totalling 3,500 line-km. On the central part of the property, this was followed up by soil geochemistry and MAX-MIN EM surveys and 1:2,000 scale mapping. Elsewhere, 1:5,000 scale mapping was undertaken.

The airborne survey identified a large number of EM conductors that correlate well with known geology. The ground geophysics program included 156 line-km of MAX-MIN EM, a further 98 km of magnetics and 43 km of VLF on selected profiles. This confirmed results of the airborne survey and outlined stratigraphy by differentiating between graphitic and non-graphitic horizons. It also delineated the extent of the thermal effect of a major intrusive, marked by the abrupt culmination of conductors of apparently-graphite origin.

Soil samples were collected at 25 m intervals along the cut grid and as contour samples on steeper areas. Samples were analyzed for Cu, Pb, Zn and Ag. Based on the first 2,000 samples, the threshold levels (mean plus two standard deviations) for the elements are as follows: 102 ppm Cu, 89 ppm Pb, 525 ppm Zn and 1.55 ppm Ag. Most anomalies relate to known mineralization.

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1981 MINERAL CLAIMS STAKED

MOULE — 105 L 1 (3)
F. Algar — (62°10'N,134°13'W)

Claims 1981: VERNA (5)

RABBIT — 105 L 9 (40)
Anaconda — (62°44'N,134°10'W)

Claims 1981: RABBIT (128)

TUM — 105 L 11 (30)
Cominco Limited — (62°45'N,135°15'W)

Claims 1981: TUM (32)

BUM — 105 L 14 (41)
Anaconda — (62°57'N,135°25'W)

Claims 1981: BUM (32)

MacARTHUR — 105 L 14 (19)
Anaconda — (62°55'N,135°15'W)

Claims 1981: KAL (292)

ONE HUMP — 105 L 15, 16 (29)
Anaconda — (62°54'N,134°42'W)

Claims 1981: CLARE (61); BUSH (32); EARN (2)

CLEAR LAKE — 105 L 10,11,12,13 14,15 (17)
Getty Canadian Metals — (62°46'N,134°57'W)

Claims 1981: SUE (60 + 16 Fr)

JAR — 105 L 16 (36)
Getty Metals — (62°46'N,134°15'W)

Claims 1981: JAR (202)

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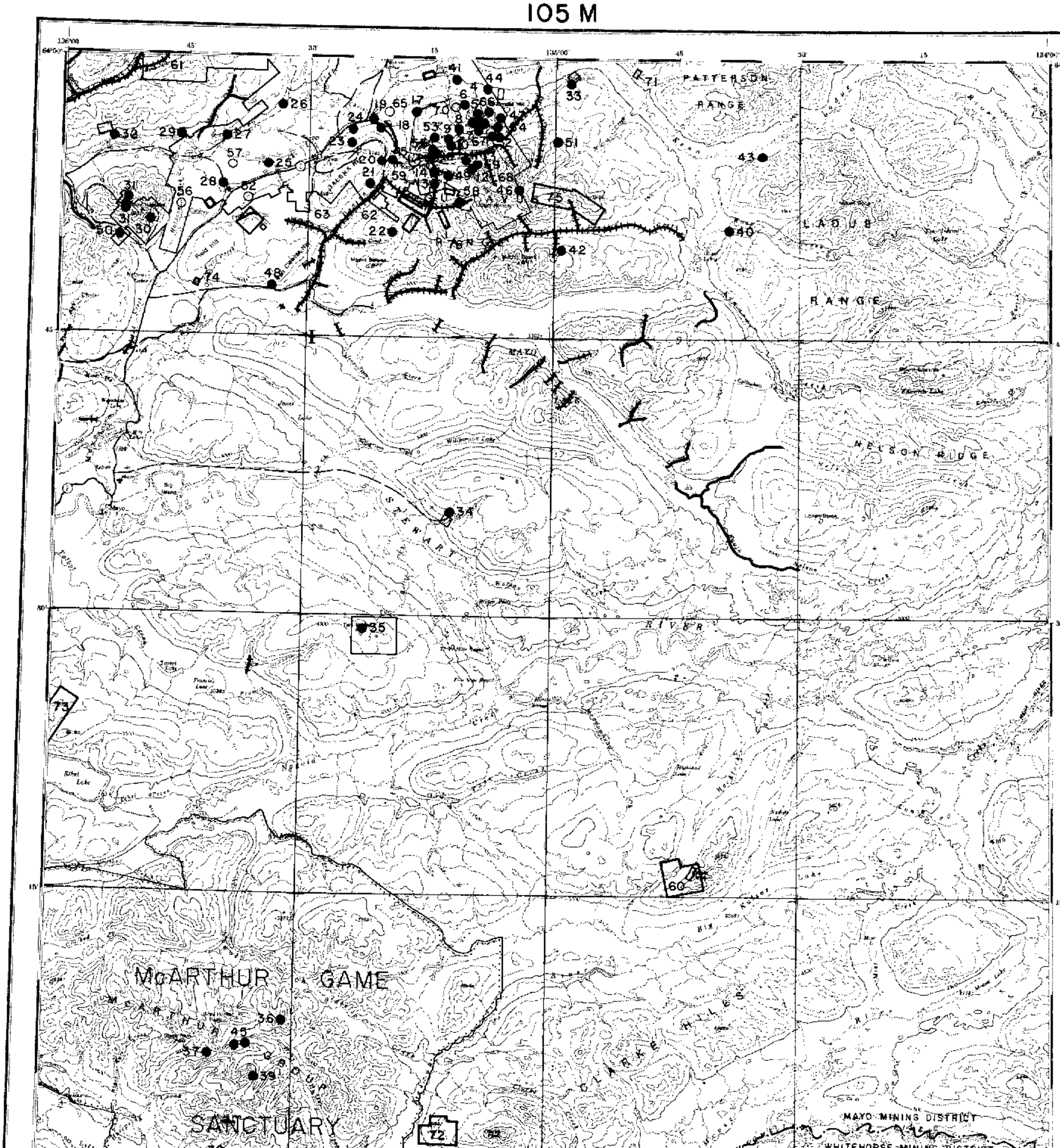
105 M



MAYO
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- ○72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ...... Mineral Claims staked in 1981
- ..... Prospecting Leases in good standing (April 1982)
- ..... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- ...... Tote Trail
- ..... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

MAYO MAP-AREA (NTS 105 M)

General Reference: GSC Map 890A by: H.S. Bostock, 1947.
GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	UNITED KENO HILL	Boyle (1965); D.I.A.N.D. (1981, p. 3, 5, 205); This Report
2	FAITH	D.I.A.N.D. (1981, p. 206)
3	DUNCAN	Boyle (1965, p. 56)
4	GOLD QUEEN	Boyle (1965, p. 52); Green (1966, p. 18-19)
5	SILVER BASIN	Boyle (1965, p. 51)
6	NABOB #2	Boyle (1965, p. 51)
7	LADUE FRACTION	Boyle (1965, p. 40)
8	COMSTOCK	Boyle (1965, p. 39, 40, 42); Green (1966, p. 15)
9	APEX	Boyle (1965, p. 42-43)
10	VANGUARD	Boyle (1965, p. 47); Green & Godwin (1963, p. 11)
11	HOMESTAKE	Boyle (1965, p. 52-53); Findlay (1967, p. 22)
12	CHRISTINE	Findlay (1969a, p. 25)
13	MO	Silver-Lead Vein
14	MAYBRUN	D.I.A.N.D. (1981, p. 206)
15	HOGAN	Boyle (1965, p. 46-47)
16	RUNER	Boyle (1965, p. 46-47)
17	WERNECKE	Findlay (1969b , p. 13)
18	FORMO	This Report
19	PADDY	Craig & Laporte (1972, p. 14)
20	EAGLE	D.I.A.N.D. (1981, p. 206)
21	FISHER	D.I.A.N.D. (1981, p. 207)
22	PARENT	This Report
23	CREAM AND JEAN	Boyle (1965, p. 78)
24	NORD	Craig & Laporte (1972, p. 13-14)
25	GERLITZKI	Green & Godwin (1963, p. 8); This Report
26	UR	Green & Godwin (1964, p. 13); This Report
27	SHANGHAI	Findlay (1967, p. 24-25)
28	WAYNE	This Report
29	ARGENT	D.I.A.N.D. (1981, p. 211)
30	STREBCHUCK	Silver-Lead-Copper Vein
31	MT. HALDANE	D.I.A.N.D. (1981, p. 207, 211)
32	LAYSIER	D.I.A.N.D. (1981, p. 211)
33	COBALT	Green (1971, p. 61)
34	GORDON	Sinclair & Gilbert (1975, p. 16-17)
35	TWO BUTTES	Garrett (1971); This Report
36	SIDE SLIP	Skarn Copper
37	PIMA	Skarn Tungsten-Copper-Zinc
38	HOT SPRING	Silver-Lead Vein
39	LOST WERNECKE COPPER	
40	ROOP	Little (1959, p. 36-37)
41	MOON	Silver-Lead Vein; This Report
42	MT. ALBERT	Silver-Lead Vein
43	McKIM	Silver-Lead Vein
44	NERO	Silver-Lead Vein
45	FRIESEN	Skarn Copper-Tungsten-Molybdenum-Silver-Gold
46	MT. HINTON	Findlay (1969a, p. 23); This Report
47	AVENUE	Craig & Milner (1975)
48	CHANCE	Antimony Vein
49	YONO	Silver-Lead Vein
50	SUNDOWN	D.I.A.N.D. (1981, p. 211)
51	GUSTAVUS	Silver-Lead Vein
52	NEWRY	
53	CHRISTAL	D.I.A.N.D. (1981, p. 208)
54	SEGSWORTH	Silver-Lead-Zinc Vein
55	IRONCLAD	Silver-Lead-Zinc Vein
56	SINISTER	D.I.A.N.D. (1981, p. 208)
57	ZAP	This Report
58	W	D.I.A.N.D. (1981, p. 209)
59	AZTEC	
60	FLO	This Report
61	WEASEL	D.I.A.N.D. (1981, p. 211)
62	FEEBLE	D.I.A.N.D. (1981, p. 211)
63	CLEAVES	D.I.A.N.D. (1981, p. 211)
64	ROSS	D.I.A.N.D. (1981, p. 211); This Report
65	GAMBLER	D.I.A.N.D. (1981, p. 209)
66	BE NO. 1	This Report
67	BE NO. 2	This Report
68	BE NO. 3	This Report
69	BE NO. 4	This Report
70	DIAMOND	D.I.A.N.D. (1981, p. 210)
71	HEART	Morin et al (1980, p. 8)
72	DOPE	This Report
73	DRILL	This Report
74	SWIFT BANANAS	This Report
75	TUF	This Report
76	LEETEE	This Report

UR, KENO HILL
GERLITZKI, MT. HINTON
United Keno Hill Mines Limited

Silver, Lead, Zinc
105 M 13,14 (1, 25, 26,46)
(63°53' - 63°58'N, 135°04' - 135°35'W)

References: Boyle, (1964); D.I.A.N.D. (1981, p. 205); Findlay (1969, p. 23); Green and Godwin (1963, p. 8-9, 1964, p. 13); Sinclair et al (1975, p. 10-12).

Claims: CH 19-21, 27, 29, 31; DICE 3-4; KPO 3; LEO 13; T; TV

Source: Summary by K. Grapes from assessment reports 090695, 090707, 090723 and 090724.

Current Work and Results:

During 1979 United Keno Hill Mines Limited drilled 91 overburden holes totalling 4,128.5 m. Thirty-two holes (1,284.7 m) were on the DICE 3 and 4 claims; five holes on CH 19; one on CH 20; 21 on CH 21; 27 on CH 27; four on CH 29; and one on CH 31. Samples of overburden and bedrock were analyzed over 1.5 m intervals on CH 27. Values up to 59 ppm Ag, 0.40% Pb and 0.57% Zn were obtained.

In 1980, 64 overburden holes were drilled totalling 2,064.1 m of which 515.0 m were on the LEO 13 claim, 534.9 m on KPO 3 and 1,014.1 m on the T and TV claims combined.

During 1981, 138,644.8 m^3 were moved by bulldozer on the Bleiler, Bermingham SW, Hector and Calumet 4-11, Sadie Ladue, Lucky Queen, Shamrock, MacLeod and Miller veins. Six diamond drill holes totalling 1,022.9 m were completed on the Tick, Bermingham and Silver King veins (two holes on each). Two hundred and thirty seven rotary percussion drill holes totalling 10,468.4 m were drilled on the Silver King, Elsa, No Cash, Calumet #18, Hector Fault and Snowdrift veins.

Production from Individual Mines by United Keno Hill Mines

1981

Mines	Silver Grade (gm/t)	Tonnes Milled	Drifts & Crosscuts (m)	Raises (m)	D.D. (m)
ELSA	798.8	1,963.6	38.7	12.8	1,947
KENO	840	26,305.5	55.8	5.5	--
NO CASH	--	1,000	5.8	--	--
RUBY	1,453.7	3,346	60.0	1.8	--
HUSKY	1,162	12,480	175	4.27	--
SIME/BERMINGHAM	576	40,996	-------Open Pits-------		
PORCUPINE	--	--	--	86.0	--
Total		86,091	335.3	110.4	1,947

Reserves of Individual Mines at Year End:

Mine	1979		1980		1981	
	Reserves (tonnes)	Silver Grade (gm/t)	Reserves (tonnes)	Silver Grade (gm/t)	Reserves (tonnes)	Silver Grade (gm/t)
ELSA	19,051	--	11,714	1,008	8,769	1,131.4
COMSTOCK KENO	8,372	1,029	8,372	1,029	13,559.1	956.6
KENO	39,114	830	27,668	809	26,305.5	840
NO CASH	13,182	902	17,518	819	17,015	822.8
RUBY	12,734	1,128	10,836	998	8,535	970.3
HUSKY	50,850	1,505	47,258	1,330	44,432.7	1,385
SIME & BERMINGHAM	104,738	790	73,188	904	--	--
OTHER OPEN PIT RESERVES	10,976	--	133,755	--	5,854.5	925.7
OTHER UNDERGROUND RESERVES	40,934	--	105,502	--	91,535.5	658.3
Total	299,951	--	435,811	--	*216,006	--

* total open pit reserves not recorded

SUMMARY OF OPERATIONS OF UNITED KENO HILL MINES LIMITED

Summary of Production from Keno Hill-Galena Mines:

	1978	1979	1980	1981
Tonnes Mined	127,424	155,361	95,067	63,477.7
Tonnes Milled	81,722	111,685	79,655	60,840
Daily Average Milled (tonnes)	326	406	388*	367.4
Mill Heads:				
Silver (gm/tonne)	1,224	818	789	754.3
Lead (%)	5.5	3.7	3.4	2.5
Zinc (%)	0.8	0.6	0.8	--
Metal Production:				
Silver (gm)	90,741,633	78,907,533	58,963,139	36,020,435
Lead (gm)	3,448,912	2,726,862	2,212,353	1,019,649
Zinc (kg)	11,971	379,164	413,043	---
Cadmium (kg)	171	---	---	---
Metal Sales:				
Revenue from Shipments ($)	18,162,909	53,226,219	31,742,000	12,561,000
Ore Reserves at Year End:				
Tonnes	99,517	299,951	435,811	242,636.4
Silver (gm/tonne)	1,364	998	846	925.7
Lead (%)	4.9	4.3	3.4	4.1
Zinc (%)	0.9	---	---	---

*Adjusted for strike of 122 days.

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FORMO
Rio Plata Silver Mines

Silver, Lead, Zinc
105 M 14 (18)
(63°56'N,135°02'W)

References: D.I.A.N.D. (1981, p. 205); Sinclair et al (1975, p. 12-13).

Claims: PAPOOSE; TYEE; PREMIER; SPRUCE; CHEECHAKO; ROCKET; TILLICUM; DOROTHY; TAGISH; SKOOKUM; BIRCH; BRA; SOMETHING Fr; WIMPY Fr

Current Work and Results:

Thirty-three holes totalling 1,777 m of percussion drilling and six holes totalling 289.6 m of diamond drilling were completed on the ROCKET, TAGISH, SKOOKUM and DOROTHY claims. The drilling failed to extend the area of significant silver mineralization.

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WAYNE
Island Mining and Exploration Company Limited

Gold, Silver, Lead, Zinc
105 M 13 (28)
(63°53'N,135°40'W)

Reference: Findlay (1969, p. 26).

Claims: WAYNE; DON; MARY

Source: Summary by K. Grapes from assessment report 090933 by T.M. Elliot.

Current Work and Results:

Fourteen N size diamond drill holes totalling 1,211.6 m were drilled in the Keno Hill quartzite on the WAYNE No. 5 claim during May and June, 1981.

Assay results indicate moderately high gold values (up to 33.3 g Au/t) in schist associated with anomalous values of tungsten (2.07% WO_3). Gold also occurs in the quartzite (up to 15.1 g Au/t) and in stringers (19.9 g Au/t) associated with moderate values of silver (up to 137.8 g Ag/t), lead (up to 5.22% Pb) and zinc (up to 4.78% Zn). Moderately anomalous values of lead and zinc (up to 2.06% Pb and 2.53% Zn) also occur in vein breccias.

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TWO BUTTES
Du Pont of Canada Exploration Limited

Tungsten Skarn
105 M 6 (35)
(63°24'N,135°22'W)

Reference: D.I.A.N.D. (1981, p. 205, 207).

Claims: W 1-24; TW 25-80

Current Work and Results:

Three NQ size diamond drill holes totalling 393 m were drilled on the W1 and W2 claims. Low-grade skarn mineralization was intersected.

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ZAP
Canada Tungsten Mining Corporation Limited

105 M 13, 14, 106 D 3, 4 (57)
(63°54'N,135°40'W)

References: Boyle, (1964); Gabrielse et al, (1965); McTaggart, (1960); Sinclair et al, (1981); Tempelman-Kluit, (1970); Tessari et al, (1980).

Claims: ZAP 1-627, 1000 Fr-2001 Fr

Source: Summary by K. Grapes from assessment report 090999 by C.N. Orssich.

Current Work and Results:

Four hundred and eighty-four metres of diamond and hammer drilling were completed in three holes on the ZAP 21, 22 and 25 claims. A small grid was surveyed on the ZAP 21 and 22 claims to provide drill hole locations control, and road building and drill site preparation were conducted on the ZAP 21-26 and 1012 Fr claims.

Two of the drill holes were in the favourable Central Quartzite and Greenstone units; one hole was in the Upper Schist. Vein faults containing sphalerite were intersected in two of the holes, with values of up to 18.2 g Ag/t, 0.11% Pb and 6.00% Zn.

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FLO
Union Carbide Canada Limited

Tungsten Veins and Stockwork
105 M 7 (60)
(63°15'N,134°43'W)

Reference: D.I.A.N.D. (1981, p. 210).

Claims: WOLF 1-48; PAT; BLACKIE; DAVID

Source: Summary by K. Grapes from assessment report 090878 by C.N. Forster.

Description:

The property consists of 51 claims located on the south peak of the Kalzas Twins, 69 km east of Mayo.

The claims are underlain by a thick sequence of quartzite, schist, slate and grits of the Yukon Group. Quartz veins with varying amounts of wolframite are found in talus over 60% of the property.

Wolframite occurs as small blebs to large-bladed crystals 10 cm in length and as black amorphous veins and fracture-filled stockworks in the quartzite and grits.

Current Work and Results:

Sixty rock, 30 stream sediment and 141 soil samples collected over 24 line km, and 41 bulk samples were taken and analyzed for tungsten, tin, silver and zinc.

Rock and soil geochemistry have roughly delineated a 1,500 m by 400 m zone of greater than 1,000 ppm W containing significant concentrations of wolframite and quartz veining. Several anomalous tungsten (900 ppm W) and tin (214 ppm Sn) values were obtained from soil samples taken below known mineralization.

Bulk sampling of rocks from talus cones within the tungsten anomalous zone returned grades up to 0.92% WO_3 in quartz float and 0.32% WO_3 in the mineralized sedimentary rocks.

Cassiterite, molybdenite, arsenopyrite, pyrrhotite, galena and silver occur peripheral to the wolframite zone. Scheelite is fairly common replacing wolframite and as pods in both the quartz veins and silicified quartzites and grits.

Alteration is intense and zoned from a quartz-tourmaline core coincident with the tungsten zone outward through quartz sericite into a poorly-developed pyrite-pyrrhotite halo.

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BE 1,2,3,4
Canada Tungsten Mining Corporation Limited

Silver, Lead, Zinc Veins
105 M 14 (66,67,68,69)
(63°57'N,135°02'W)

References: Boyle (1965); D.I.A.N.D. (1981, p. 205, 210); Gleeson and Boyle (1976, p. 22); Green (1971, p. 72); Sinclair et al (1980).

Claims: BE 1-279, 281-284, 285 Fr-322 Fr (in total 321 claims)

Source: Summary by K. Grapes from assessment report 090995 by D.N. Bonnar.

Current Work and Results:

During the 1981 field season, geological mapping at 1:5,000 scale was conducted by BEMA Industries Ltd. in the south portion of the claim group where fractional claims were staked.

Three mineralized vein structures were outlined within close proximity of each other on the north nose of the ridge dividing McNeill and McMillan Gulches.

Two of the occurrences are quartz stockwork vein systems with minor galena disseminations. Grab samples of the veins assayed 6.3 g Ag/t to 490.3 g Ag/t. The third occurrence is a quartz vein with minor disseminated arsenopyrite enveloped by a 5 m long quartz stockwork. A grab sample of the vein assayed 194.1 g Ag/t and 31.5 g Au/t.

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1981 MINERAL CLAIMS STAKED

DOPE
Amax of Canada Limited

105 M 3 (72)
(63°02'N,135°12'W)

Claims 1981: DOPE (40)

DRILL 105 M 5,115 P 8(73)
Amax of Canada Limited (63°24'N, 136°00'W)

Claims 1981: DRILL (60)

FLO 105 M 7 (60)
Union Carbide (63°15'N,134°43'W)

Claims 1981: WOLF (52)

SWIFT BANANAS 105 M 13 (74)
M. Wagner (63°47'N,135°43'W)

Claims 1981: SWIFT BANANAS

ISABEL 105 M 13 (75)
I. Tornai; S. Tornai (63°51'N,135°37'W)

Claims 1981: ISABEL (8); STEVE (8)

UNITED KENO HILL 105 M 13 (1)
United Keno Hill Mines Limited (63°54'N,135°40'W)

Claims 1981: SNOWDRIFT (9)

MOON 105 M 14 (41)
J. Tiffen (63°59'N,135°15'W)

Claims 1981: JODI (8)

ROSS 105 M 14 (64)
J. Ross et al (63°52'N,135°17'W)

Claims 1981: ROSS (11)

PARENT 105 M 14 (22)
Multi-line Management Corporation (63°51'N,135°18'W)

Claims 1981: FOOTE (8)

TUF 105 M 14, 15 (75)
Meldean Placers Limited (63°53'N,135°00'W)

Claims 1981: TUF (32); RAT (32)

LEE TEE 105 M 14 (76)
D. Flick (63°51'N,135°13'W)

Claims 1981: LEE TEE (4)

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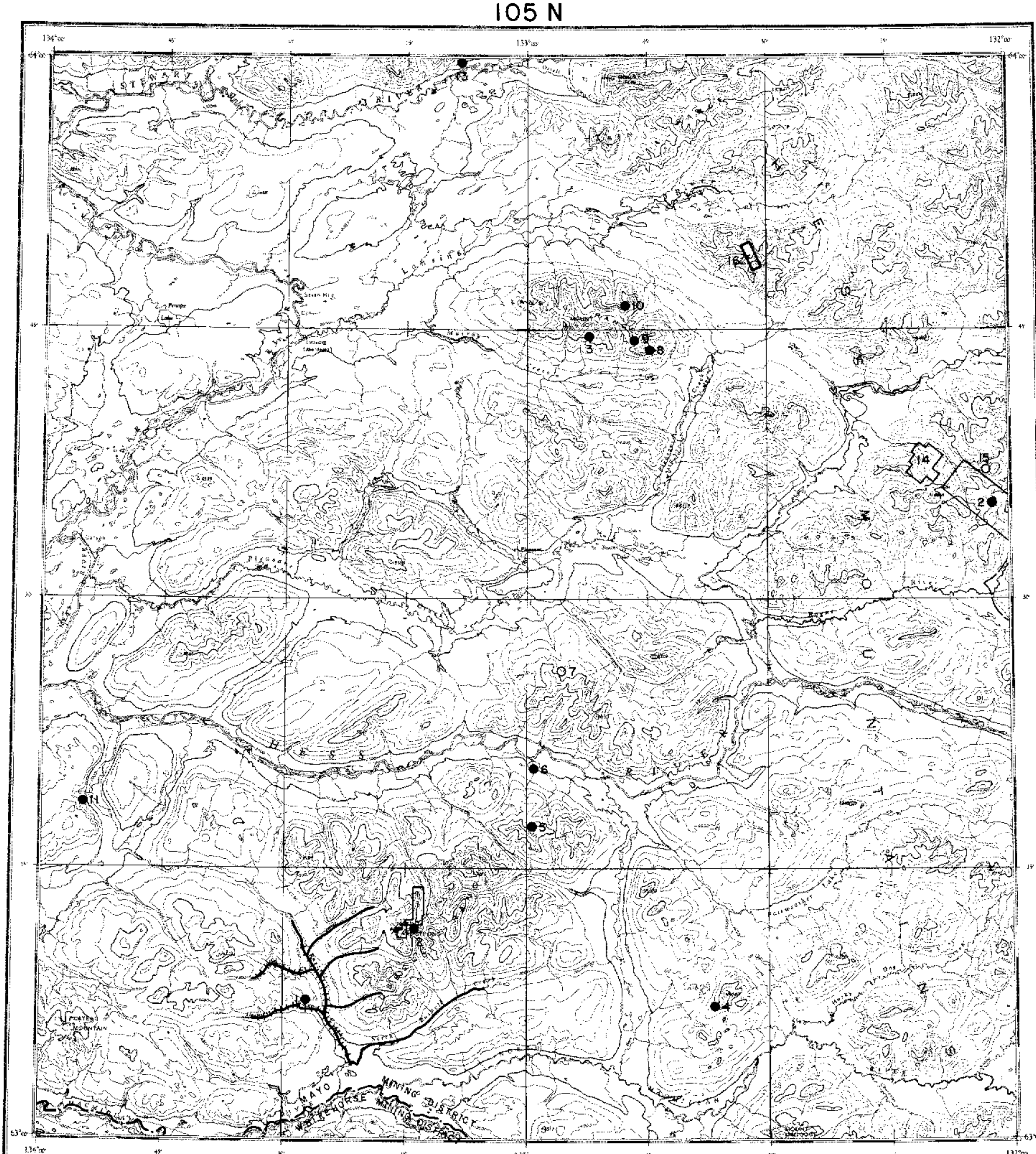
105 N



LANSING

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- ○72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ...... Mineral Claims staked in 1981
- ...... Prospecting Leases in good standing (April 1982)
- ...... Placer Claims in good standing (April 1982)
- CEL........ Coal Exploration Licence
- CML........ Coal Mining Lease
- ...... Tote Trail
- ...... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

LANSING MAP-AREA (NTS 105 N)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974
GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	ARMSTRONG	Mulligan (1975, p. 74)
2	GREG	Sinclair et al (1975, p. 17-18)
3	JOY	Copper Occurrence
4	GOLF	Skarn Copper
5	ETZEL	Copper Vein
6	BRODELL	Copper Vein
7	PEBBLE	Lead Occurrence
8	DEAN	Lead Vein
9	AUREOLE	Copper Vein
10	BLOOM	Copper-Molybdenum-Lead-Cobalt Vein
11	PLEASANT	Skarn Copper-Tungsten-Silver
12	TONGUE	Skarn Tungsten-Copper-Tin
13	KIDD	Zinc Stratabound
14	FLATASA	This Report
15	SPIS	D.I.A.N.D. (1981, p. 213)
16	ANDREA	This Report

FLATASA
Argent Joint Venture;
Rio Alto Explorations;
Rad Development;
ABM Mining;
Ebony Oil Corporation;
Welcome North Mines;
Archer, Cathro and Associates Limited

Geochemical Target
105 N 9 (14)
(63°37'N,132°10'W)

Reference: D.I.A.N.D. (1979-80, p. 213).

Claims: FLATASA 1-40

Source: Summary by K. Grapes from assessment report 090822 by A.R. Archer.

History:

The FLATASA claim group was staked in August, 1980 to cover two drainage areas which returned anomalous silver and lead values as a result of an earlier regional exploration program.

Description:

The FLATASA claims are located in the Hess Mountains west of Cyprus Anvil's PLATA property.

They are underlain by a thick sequence of marine sedimentary rocks with minor volcanics ranging in age from Hadrynian to Triassic. A northwest trending belt of mid-Cretaceous granodiorite and quartz monzonite stocks cuts across the claims.

Current Work and Results:

Geological mapping and grid geochemical sampling of the property were conducted in August, 1980.

Approximately 640 soil samples were collected and analyzed for Cu, Pb and Ag. Copper and lead values are low. A significant proportion of the samples returned values greater than 0.6 ppm silver. These high values tend to occur singly and may represent spurious anomalies caused by irregular organic concentration of the silver contents of black shale into overlying soils. A weakly anomalous area 700 m by 500 m was delineated.

Prospecting and geologic mapping failed to detect any lead-silver mineralization.

******

ANDREA
Prism Resources Limited

Barite
105 N 15 (16)
(63°44'N,132°32'W)

Claims: ANDREA 1-12

Source: Summary by K. Grapes from assessment report 090991 by G. Sivertz.

History:

The ANDREA claims were staked in 1981 to cover a barite occurrence.

Description:

The claims are located 160 km east of Mayo.

The area of the claims is underlain by a Paleozoic sequence of quartzite, chert-pebble conglomerate, black shale and massive chert. Massive and bedded barite occurs just above the chert-pebble conglomerate in black shale. The barite horizon can be traced for about 1,200 m.

Current Work and Results:

The property was prospected, mapped and soil sampled during July, 1981. A total of 372 soil samples were collected and analyzed for Mo, Cu, Pb, Zn, Ag, Au and Ba. No base metal sulphide occurrences or anomalies were found associated with the barite occurrence.

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1981 MINERAL CLAIMS STAKED

ANDREA
Prism Resources Limited

105 N 15 (16)
(63°49'N,132°32'W)

Claims 1981: ANDREA (12)

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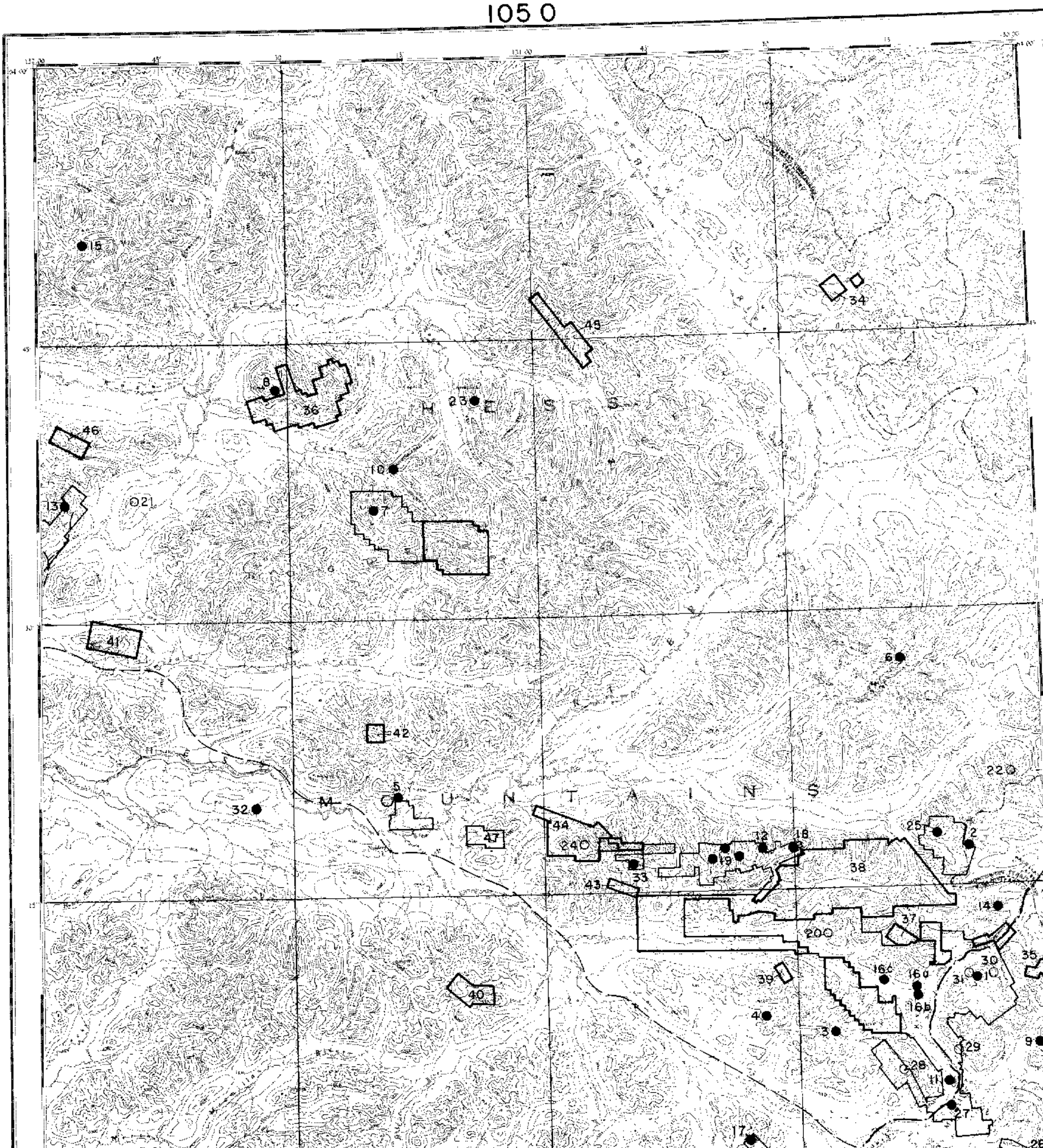

NIDDERY LAKE

YUKON TERRITORY - NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

..... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

...... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

NIDDERY LAKE MAP-AREA (NTS 105 O)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974.
GSC Open File 765 by: M.P. Cecile, 1981.
GSC Open File 807 by: S.P. Gordey, 1981.

NO.	PROPERTY NAME	REFERENCE
1	TOM	This Report
2	MACTUNG	Morin et al (1977, p. 20-22)
3	JEFF	Garrett (1971, p. 73)
4	ALP	Gold-Silver Vein
5	SCOT	Craig & Milner (1975, p. 18)
6	KEELE	Garrett (1971, p. 73)
7	EMERALD	Wheeler (1954, p. 40-41); This Report
8	HORN	Craig & Milner (1975, p. 17)
9	BEN	Zinc Stratabound
10	ARROWHEAD	Copper Vein
11	RACICOT	Sinclair et al (1975, p. 21-22)
12	HESS	This Report
13	INCA	Sinclair et al (1975, p. 18)
14	STANDARD	Lead-Zinc-Silver Occurrence
15	ODD	Lead-Zinc Stratabound
16	JASON	This Report
17	BROCK	Barite Stratabound
18	WALT	D.I.A.N.D. (1981, p. 216)
19	TRYALA	Barite Stratabound
20	NIDD	This Report
21	BOBNOB	D.I.A.N.D. (1981, p. 217)
22	BORD	D.I.A.N.D. (1981, p. 217)
23	BEAUCHAMP	D.I.A.N.D. (1981, p. 217)
24	NEVE	This Report
25	KEN	Sinclair et al (1976, p. 30)
26	PETE	Morin et al (1979, p. 94)
27	MOONLIGHT	Morin et al (1979, p. 32)
28	ESS	Morin et al (1977, p. 32)
29	FETCH	Morin et al (1980, p. 8)
30	CREE	Morin et al (1979, p. 33)
31	ARGO	Morin et al (1980, p. 9)
32	MV	Morin et al (1980, p. 10)
33	MAC	This Report
34	DUO	This Report
35	FOG	This Report
36	OLD CABIN	This Report
37	FUN	This Report
38	FAN	This Report
39	SIM	This Report
40	SUN	This Report
41	EMERA	This Report
42	EMMY	This Report
43	FAL	This Report
44	BAR	This Report
45	URSA	This Report
46	ETZEL	This Report
47	ANDY	This Report

TOM
Hudson Bay Exploration and Development Company Limited

Silver, Lead, Zinc
Stratiform
105 0 1 (1)
(63°08'N,130°06'W)

References: D.I.A.N.D. (1981, p. 215); Morin et al (1980, p. 72); Carne (1976, 1979).

Claims: TOM 147-183; TS 1-29

Source: Summary by P. Watson from assessment reports 090919 and 091004 by R. Stroshein.

Current Work and Results:

In 1981, soil geochemistry and magnetometer surveys were carried out on a grid on the above-listed TOM claims, located three km south of the Tom Valley Project. Trenching over the magnetic anomaly was also undertaken.

A total of 30 test pits were excavated on the TS claims to determine the depth of overburden and the nature of the bedrock. Overburden cover in the area was found to commonly exceed five m in depth and both the hanging wall and footwall units as exposed on the TOM were encountered in a few of the test pits.

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EMERALD
AGIP Canada Limited

Uranium, Copper, Molybdenum, Gold
Tungsten
105 0 11 (7)
(63°34'N,131°16'W)

References: D.I.A.N.D. (1981, p. 215-216); Wheeler (1954, p. 41).

Claims: FIRE (22); ICE 1-143; SUN 1-139

Source: Summary by K. Grapes from assessment report 090857 by R.C.R. Robertson and R.A. Doherty and assessment report 090866 by R.C.R. Robertson, R.A. Doherty and T. Garagan.

History:

Initial staking was carried out in 1979 to cover an airborne radiometric anomaly. Additional claims were added in 1980 and 1981.

Description:

The claims are located in the central part of the Rogue Range 65 km northwest of the Macmillan Pass airstrip. Access to the Emerald Lake area is also via float plane from Ross River (370 km southwest).

Current Work and Results:

Geological mapping, prospecting and geochemical sampling were carried out on the FIRE and ICE claims in the summer of 1980 and on the FIRE, ICE and SUN claims the summer of 1981. In 1981, three trenches were excavated on the ICE claims and one on the FIRE claims, totalling 73.0 cu. m.

Several areas of mineralization were indicated by trenching and chip sampling.

******

HESS
Cominco Limited

Barite
105 0 7 (12)
(63°17'N,130°45'W)

References: Blusson (1974); D.I.A.N.D. (1981, p. 214-215); Morin et al (1979, p. 34, 1980, p. 10)

Claims: HESS 1-89

Source: Summary by K. Grapes from assessment report 090922 by R.W. Lane.

History:

The HESS claims were staked in 1976 and 1977. Since 1977 geological mapping (1:10,000 scale), prospecting and geochemical soil sampling programs were conducted. Several anomalous zones of copper, lead, zinc, silver and barium were determined.

Description:

The property overlies a sequence of thrust faulted Ordovician-Silurian and Devonian-Mississippian clastic sedimentary rocks with interbedded volcanic rocks. Within the Ordovician-Silurian rocks are extensive beds of barite, calcite and witherite up to 100 m thick, with a discontinuous strike length of approximately six km. Some pyrite, sphalerite and galena mineralization is associated with two of the barite occurrences.

Current Work and Results:

Two trenches (totalling 79 cu. m) were excavated on HESS 61; only one trench reached bedrock.

Trench 1 exposed a sequence of laminated to bedded witherite containing amounts of disseminated sphalerite, galena and tetrahedrite. Eight rock chip samples were taken. The best results were 430 ppm Cu, 30,000 ppm Pb, 21,500 ppm Zn, 83 ppm Ag and 273 ppm Cu, 42,000 ppm Pb, 11,350 ppm Zn and 122.0 ppm Ag.

******

JASON
Aberford Resources Ltd.;
Brinco;
Mitex Mining;
Ogilvie Mineral Corp.

Zinc, Lead, Silver
Barite Stratabound
105 0 1 (16)
(63°08'- 63°11'N, 130°20'- 130°27'W)

References: Blusson (1974); D.I.A.N.D. (1981, p. 215-216); Morin et al (1977, p. 114; 1979, p. 31; 1980, p. 8).

Claims: J.K. 1-160; JASON 1-4, 7-39, 41-82, 84-135, 137, 141-240; MIKE 1-10; ACE 1-33, 35-40

Source: Summary by K. Grapes from assessment report 090913 by J.D. Kapusta.

Description:

The J.K. claims were staked in 1981 to cover a barite occurrence adjacent to the JASON claims.

The JASON claim group is located nine km northwest of the Canol Road at Macmillan Pass, on the east margin of the Selwyn Basin tectonic province. The property is underlain by a middle Paleozoic succession of clastic sedimentary rocks. The oldest rocks exposed on the claims belong to the transition facies of the Road River Formation.

Folds on the J.K. claims plunge 10°-30° northwest with axial trends at approximately 360°. Faulting tends to parallel the axial planes of both anticlines and synclines.

Current Work and Results:

A regional exploration program of prospecting, geological mapping and geochemistry was carried out on the J.K. claims during 1981. Twenty km of line were cut in preparation for the 1982 season.

Barite has been found in one location on the property, with a strike length of over one km and thickness varying from three to ten m.

A total of 11,169.7 m of combined HQ, NQ and BQ core was drilled in 27 holes on five of the JASON claims (21,55,57,58,155) in 1981. Down-the-hole sampling, assays for ore intersections and trace element geochemistry were carried out. Ten trenches were excavated by backhoe on JASON claims 54-55, 144 and 145. Each trench measured 50-100 m in length, one m in width and two m in depth. A VLF-EM survey was conducted on claims 145-156, 220-222 Fr and 143-144.

******

NIDD
Cominco Limited

Zinc, Lead
105 O 1, 2 (20)
(63°12'N,130°30'W)

References: D.I.A.N.D. (1981, p. 215-217); Morin et al (1980, p. 9); Morin et al (1979, p. 34); Blusson (1974a; 1976); Carne (1976, 1979).

Claims: NIDD 1-406

Source: Summary by K. Grapes from assessment reports 090863 and 090924 by R.W. Lane.

History:

The NIDD 1-315 claims were staked in 1976, the NIDD 316-346 in July, 1977 and an additional 60 claims were added in 1980. Geological mapping, geochemical soil sampling, geophysical surveys and prospecting have been carried out on the property.

Description:

The claims form a 23 km long east west trending block located 5 to 27 km west of Macmillan Pass airstrip.

The property overlies the Ordovician to Mississippian Road River, Canol and Imperial Formations. Galena and sphalerite mineralization in the Road River and Canol Formations is the exploration target.

Current Work and Results:

Trenching and diamond drilling were undertaken on the property between June and October, 1981.

A hand excavated trench 110 m long by 1 m wide exposed siderite, conglomerate, mudstone/siltstone, pyrite and talc chlorite schist. Minor amounts of sphalerite replacement of siderite, matrix and some chert clasts occur along fault and fracture zones.

Three trenches roughly totalling 5,220 cu. m were excavated. All trenches exposed mudstone and conglomerate. One of the trenches exposed minor sphalerite along fractures.

Five diamond drill holes totalling 878.13 m were drilled on NIDD claims 218 and 225. Trace to moderate values of Pb-Zn were intersected.

******

NEVE
AGIP Canada Limited

105 O 7 (24)
(63°18'N,130°55'W)

Reference: D.I.A.N.D. (1981, p. 215, 217).

Claims: NEVE 1-35; BRICK 1-40

Current Work and Results:

The BRICK 1-40 and NEVE 1-35 claims were staked in 1981. During that year the BRICK 1-12 claims were mapped at a scale of 1:10,000. Stream sediment, soil and rock chip samples were collected and analyzed. Several small anomalies were determined.

******

MAC
Hudson Bay Exploration and Development Company Limited

Barite Stratabound
105 O 7 (33)
(63°16'N,130°45'W)

Reference: Lydon et al (1979, p. 223-229)

Claims: MAC 1-24

Source: Summary by K. Grapes from assessment report 090666 by R. Stroshein.

History:

In July, 1979, 122 claims were staked covering several bedded barite occurrences located by reconnaissance geochemical sampling and prospecting. Subsequent to staking, reconnaissance geological mapping, prospecting and stream sediment sampling located 15 barite occurrences within the claim group. Seven reconnaissance soil grids were established on the property. All samples collected were analyzed for Pb, Zn and Ag. Rocks were also analyzed for $BaSO_4$.

Description:

The MAC claim group is located approximately 170 km northeast of Ross River, 25 km east of the Macmillan Pass airstrip.

The claims are underlain by Devono-Mississippian argillite units separated by a chert pebble conglomerate unit which are locally correlated to the Canol Formation. The bedded barite deposits appear to conform to two separate horizons, a lower blue grey weathering massive chert unit and an upper phyllitic argillite unit which hosts most of the barite. The barite is grey, massive bedded and interbanded with chert, finely crystalline in the lower unit and medium crystalline in the upper unit.

Current Work and Results:

Between July 4 and August 13, 1980, hand trenching, detailed geological mapping, soil sampling and rock sampling were carried out immediately adjacent to most of the barite showings.

Three of the grids indicate barite ranging from 43 m to 50 m in thickness and extending 35 m to 150 m in strike length.

High mercury values (up to 2,688 ppb) occur in soils downslope of the barite outcrops.

******

OLD CABIN
Union Carbide Canada Limited

Tungsten Skarn
105 O 12 (36)
(63°42'N,131°30'W)

Claims: OLD 1-62; CABIN 1-123

Current Work and Results:

The OLD and CABIN claims were staked in 1981. They are underlain by a granodiorite stock intrusive into Hadrynian and Cambrian shales, siltstones and volcanic rocks.

The claims were mapped on a 1:20,000 scale, and rock, soil and stream sediment samples were collected. Skarn tungsten mineralization is weakly developed with scattered small quartz-pyrite-arsenopyrite veins.

******

FAN, FUN
Amax of Canada Limited

Lead, Zinc Target
105 O 1, 2 (38, 37)
(63°12' - 63°15'N,
130°18' - 130°22'W)

Claims: FAN; FUN (approximately 510 claims)

Current Work and Results:

The FAN and FUN claim blocks were staked in 1981. They are underlain by Cambrian to Devonian shale, siltstone, chert, limestone, flysch and minor volcanic breccia.

The claims were mapped on a 1:20,000 scale, and 1,325 soil samples, 36 stream sediment samples and 330 rock chip samples were taken along claim lines and contours in selected valleys.

The soil survey located two areas anomalous in Cu, Pb, Zn, Ag and Ba. Mineralization located to date includes: four pyrrhotite-pyrite beds in tuff, galena -sphalerite veins in volcanic breccia and a 10 km long barite horizon associated with pyrite and chert.

******

SIM
Hudson Bay Exploration and
Development Company Limited

Lead, Zinc Target
105 O 2 (39)
(63°10'N,130°30'W)

Claims: SIM 1-8

Current Work and Results:

The SIM claims were staked in 1981. They are located 19 km west of the TOM deposit. Sediment sampling of streams on the property returned anomalous results of lead and zinc.

******

SUN
Hudson Bay Exploration and
Development Company Limited

105 O 3 (40)
(63°10'N,131°09'W)

Claims: SUN 1-44

Current Work and Results:

The SUN claims were staked in 1981, approximately 53 km west of the TOM property. Bedded barite occurs at two localities in Upper Devonian, banded argillites which overlie massive chert of the Road River Formation. The property was mapped on a 1:31,680 scale and stream sediment samples from drainages in the area were collected and analyzed for Pb, Zn and Ag. Some anomalous values of Pb, Zn and Ag were determined.

******

FAL
Hudson Bay Exploration and
Development Company Limited

Lead, Zinc Target
105 O 7 (43)
(63°15'N,130°50'W)

Claims: FAL 1-14

Current Work and Results:

The FAL claims were staked in 1981. They lie 38 km west-northwest of the TOM property on Upper Devonian sediments of the same age as those which outcrop at the TOM deposit.

During 1981, geological mapping (1:31,680 scale), rock sampling and stream sediment sampling programs were conducted. Samples of the chert unit returned anomalous values in lead.

******

ANDY
Ventures West Minerals Limited — 105 O 6 (47) (63°17'N,131°07'W)

Claims: ANDY 1-32

Source: Summary by K. Grapes from assessment report 090833 by C.L. Smith.

History:

Interest in the property developed as a result of work conducted on the property in 1978. The previous owner allowed the claims to lapse. The claims which lie 50 km west-northwest of the MacMillan Pass airstrip was acquired by Ventures West Minerals Limited in 1979.

Current Work and Results:

During August, 1980, the area of the ANDY claims was geologically mapped on a scale of 1:5,000.

The property is underlain by a sequence of limestone, shale, conglomerate and sandstone of Ordovician to Mississippian age. The stratigraphic section is possibly correlative with the Road River Group and the Canol Formation of the MacMillan Pass area. Beds strike east-west.

Barite occurs as massive to finely laminated beds several feet thick in silver weathering carbonaceous shale.

No lead-zinc mineralization has been observed.

******

1981 MINERAL CLAIMS STAKED

FOG
Amax of Canada Limited — 105 O 1 (35) (63°10'N,130°01'W)

Claims 1981: FOG (20)

TOM
R. Deklerk *et al* — 105 O 1 (1) (63°12'N,130°12'W)

Claims 1981: TS (44)

FUN
Amax of Canada Limited — 105 O 1 (37) (63°12'N,130°18'W)

Claims 1981: FUN (25)

JASON
Pan Ocean Oil Limited — 105 O 1 (16) (63°09'N,130°23'W)

Claims 1981: JK (160)

NIDD
Cominco Limited — 105 O 1 (20) (63°10'N,130°21'W)

Claims 1981: NIDD (337)

FAN
Amax of Canada Limited — 105 O 1, 7 (38) (63°15'N,130°22'W)

Claims 1981: FAN (510)

SIM
Hudson Bay Exploration and Development — 105 O 2 (39) (63°10'N,130°31'W)

Claims 1981: SIM (8)

SUN
Hudson Bay Exploration and Development — 105 O 3 (40) (63°10'N,131°10'W)

Claims 1981: SUN (44)

EMERA
K. Dieckman — 105 O 5 (41) (63°29'N,131°52'W)

Claims 1981: EMERALD (66)

EMMY
Union Carbide — 105 O 6 (42) (63°24'N,131°20'W)

Claims 1981: EMMY (16)

FAL
Hudson Bay Exploration and Development — 105 O 7 (43) (63°15'N,130°51'W)

Claims 1981: FAL (14)

NEVE
AGIP Canada Limited — 105 O 7 (24) (63°18'N,130°57'W)

Claims 1981: BRICK (40); NEVE (20)

BAR
Hudson Bay Exploration and Development — 105 O 7 (44) (63°19'N,130°57'W)

Claims 1981: BAR (30)

MAC
Hudson Bay Exploration and Development — 105 O 7 (33) (63°17'N,130°52'W)

Claims 1981: MAC (22)

URSA
Noranda Exploration Company Limited — 105 O 10, 16 (45) (63°45'N,130°55'W)

Claims 1981: URSA (56)

EMERALD 105 O 11 (7)
AGIP Canada Limited (63°34'N,131°10'W)

Claims 1981: SUN (139)

OLD CABIN 105 O 11 (36)
Union Carbide (63°42'N,131°30'W)

Claims 1981: CABIN (123); OLD (62)

ETZEL 105 O 12 (46)
Union Carbide (63°40'N,131°57'W)

Claims 1981: ETZEL (32)

DUO 105 O 16 (34)
Canadian Nickel Company (63°47'N,130°23'W)

Claims 1981: DUO (20)

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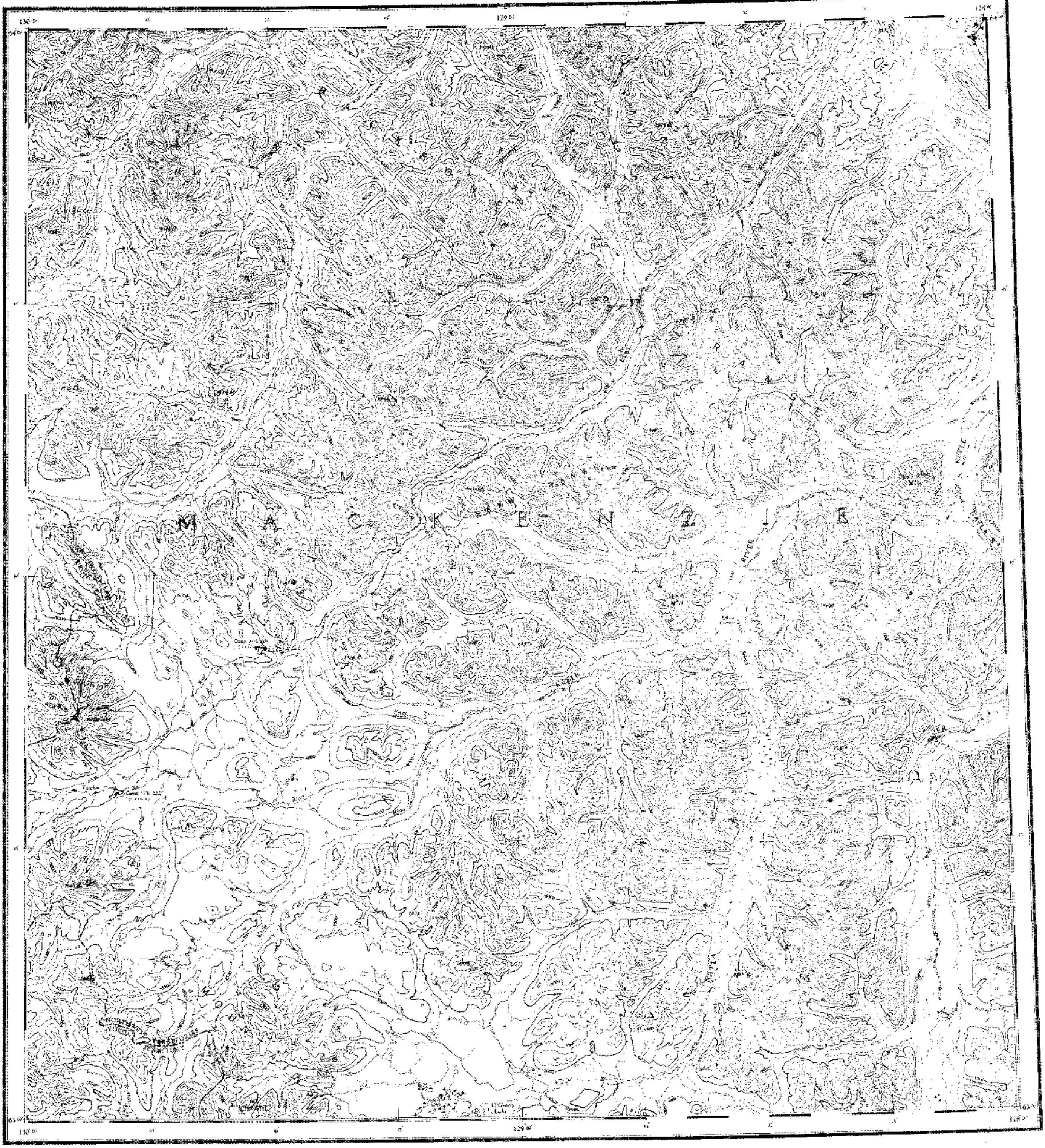
105 P



SEKWI MOUNTAIN

NORTHWEST TERRITORIES – YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

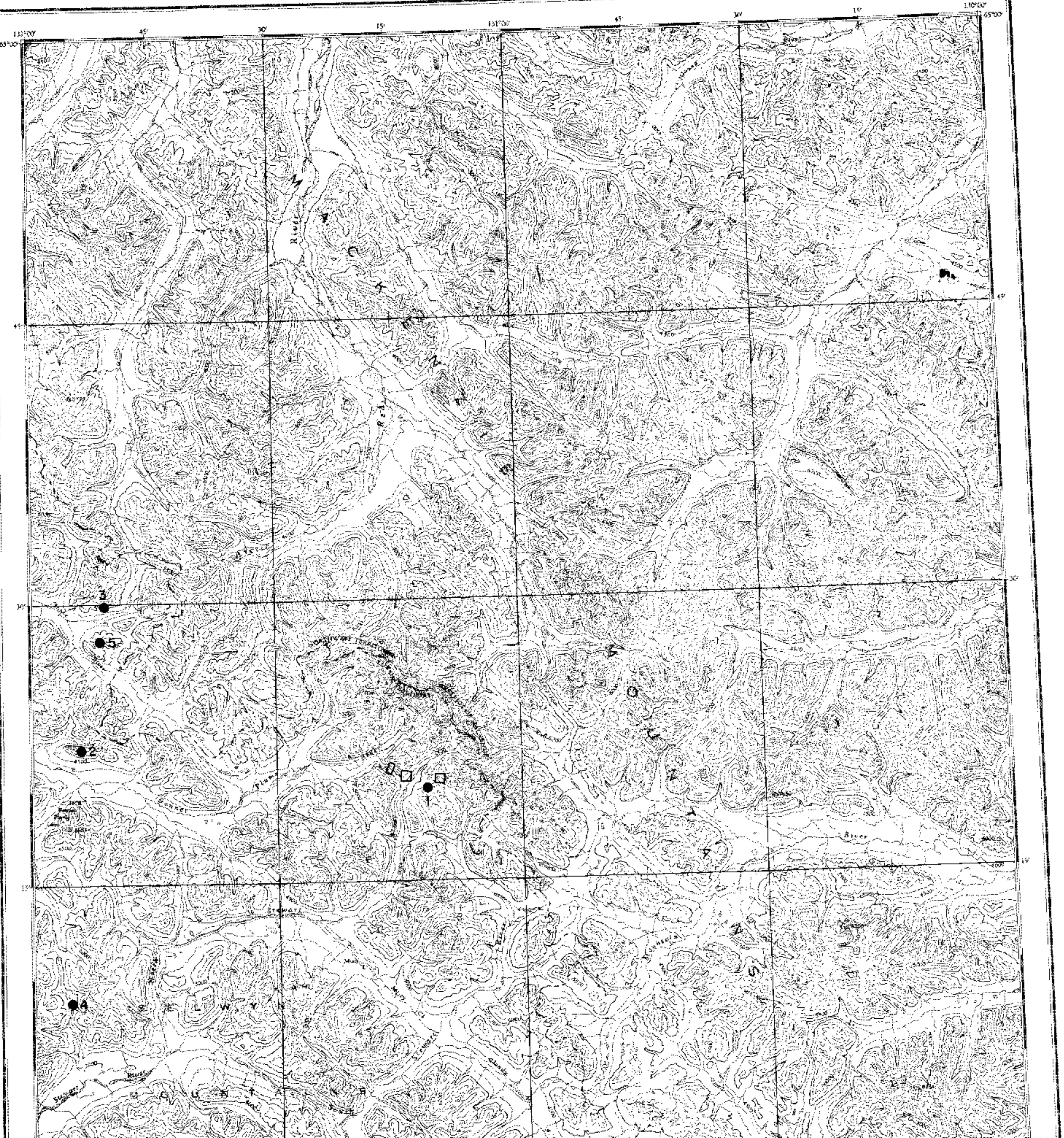
●61 ....Mineral Deposit or Occurrence see key on facing page	.....Prospecting Leases in good standing (April 1982)	......Tote Trail
○72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	.....Driveable Road
......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981	CEL........Coal Exploration Licence	..........Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	..........Airstrip

SEKWI MOUNTAIN MAP-AREA (NTS 105 P)

General Reference: GSC Paper 71-22 by: S.L. Blusson, 1971
GSC Open File 710 by: M.P. Cecile, 1980
GSC Open File 807 by: S.P. Gordey, 1981

NO.	PROPERTY NAME	REFERENCE
1	MEHITABEL	Skarn Copper-Tungsten-Molybdenum

106 B



BONNET PLUME LAKE

YUKON – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- ○72 .... Unmineralized Target
- ...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- ...... Mineral Claims staked in 1981
- ..... Prospecting Leases in good standing (April 1982)
- ..... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- ..... Tote Trail
- ..... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

BONNET PLUME MAP-AREA (NTS 106 B)

General Reference: GSC Open File 205 by: S.L. Blusson, 1974
GSC Open File 710 by: M.P. Cecile, 1980

NO.	PROPERTY NAME	REFERENCE
1	ECONOMIC	Sinclair *et al* (1975, p. 19)
2	ANDY	Dawson (1975, p. 240-241)
3	NECO	Zinc-Lead Vein
4	BIRKELAND	Lead-Zinc
5	PR	Morin *et al* (1977, p. 118)

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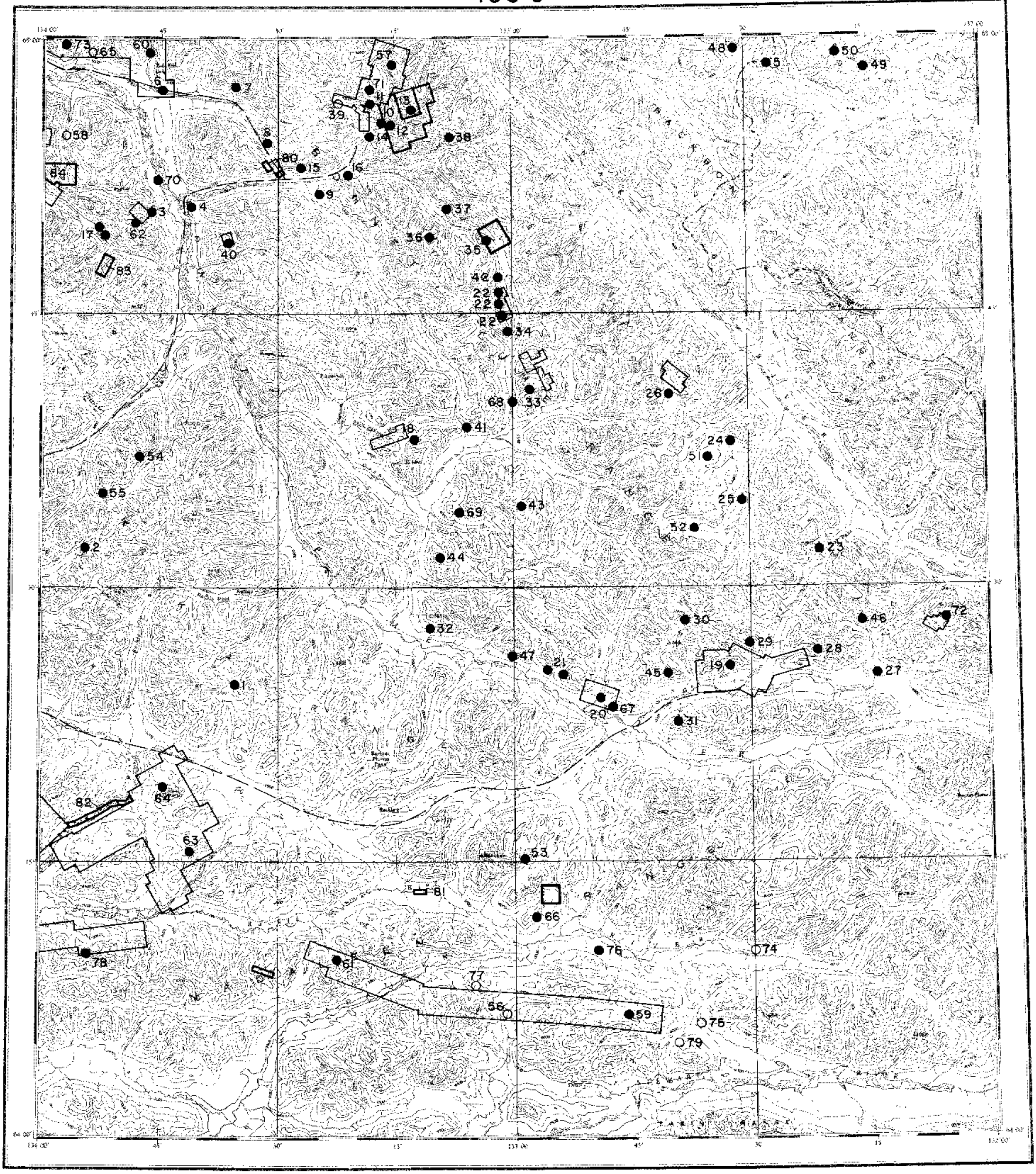

NADALEEN RIVER

YUKON TERRITORY – NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ● 61 .... Mineral Deposit or Occurrence see key on facing page
- ○ 72 .... Unmineralized Target
- .... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- .... Mineral Claims staked in 1981
- ..... Prospecting Leases in good standing (April 1982)
- ..... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- .... Tote Trail
- .... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

NADALEEN RIVER MAP-AREA (NTS 106 C)

General Reference: GSC Open File 205, 206 by: S.L. Blusson, 1974.
GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	KOHSE	Copper Occurrence
2	SALUTATION	Copper-Cobalt Vein
3	GILLESPIE	Lead-Zinc Vein
4	GEORDIE	Lead-Zinc-Silver Occurrence
5	GILDERSLEEVE	Dawson (1975, p. 241)
6	FAIRCHILD	D.I.A.N.D. (1981, p. 223)
7	BIBBER	Copper Vein
8	DOLORES	Copper-Silver-Cobalt Vein
9	KEY MOUNTAIN	This Report
10	MAMMOTH	Findlay (1969b, p. 16-17)
11	CIRQUE	Copper-Cobalt-Silver Vein
12	PORPHYRY	Findlay (1969b, p. 16-17)
13	TETRAHEDRITE CREEK	This Report
14	AIRSTRIP	Copper
15	VULCAN	This Report
16	DOBBY	Copper Occurrence
17	KIDNEY	Copper Vein
18	CORN CREEK	Sinclair et al (1975, p. 52-54)
19	GOZ CREEK	Sinclair et al (1975, p. 23-24)
20	HARRISON	Sinclair et al (1975, p. 41-42)
21	MUELLER	Sinclair et al (1975, p. 42-43)
22	COB	Sinclair & Gilbert (1975, p. 59)
23	ZOG	Zinc Occurrence
24	GOODMAN	Sinclair et al (1975, p. 64-65)
25	NEST	Sinclair et al (1975, p. 33-35)
26	TOPOROWSKI	Zinc-Lead Stratabound
27	ANGLO	Sinclair et al (1975, p. 38, 40)
28	GUS	Sinclair et al (1975, p. 36-39)
29	GENTRY	Sinclair et al (1975, p. 24-28)
30	CADET	Sinclair et al (1975, p. 29, 46)
31	LOG	Sinclair et al (1975, p. 34)
32	MOUSE	Sinclair et al (1975, p. 40-41, 49-50)
33	FRIGSTAD	Sinclair et al (1975, p. 55-57)
34	SPECTROAIR	Sinclair et al (1975, p. 58-59)
35	PROFEIT	This Report
36	POO	Lead-Zinc Vein
37	CARNE	Sinclair et al (1975, p. 61-62)
38	DAN	Sinclair et al (1975, p. 61)
39	DOWSER	Sinclair et al (1975, p. 63)
40	LEARY	Zinc-Lead-Copper Vein
41	CANWEX	Sinclair et al (1975, p. 56-57)
42	COAST	Sinclair et al (1975, p. 60)
43	BOB	Lead-Zinc Occurrence
44	BRENDON	Sinclair et al (1975, p. 51)
45	GAL	Sinclair et al (1975, p. 30-31)
46	ENVOY	Sinclair et al (1975, p. 37, 39)
47	TAPIN	Sinclair et al (1975, p. 58)
48	CAB	Sinclair et al (1975, p. 65)
49	BAK	Zinc-Lead Stratabound
50	MOGUL	Sinclair et al (1975, p. 66)
51	DUNE	Zinc-Lead Vein
52	SNAKE	Lead-Zinc Stratabound
53	McKELVIE	Zinc-Lead-Barium Vein
54	MARSHALL	Copper Occurrence
55	ALGAE	Copper Occurrence
56	LEAH	This Report
57	RAM	D.I.A.N.D. (1981, p. 224)
58	LFV	D.I.A.N.D. (1981, p. 235)
59	SIAN	D.I.A.N.D. (1981, p. 224)
60	OTTER	This Report
61	CRAIG	D.I.A.N.D. (1981, p. 225-230)
62	TOW	D.I.A.N.D. (1981, p. 231)
63	VAL	This Report
64	VERA	This Report
65	ELGEA	This Report
66	TARA (NADALEEN)	This Report
67	FUN	Sinclair et al (1976, p. 41)
68	DF	Sinclair et al (1976, p. 50)
69	MID	Sinclair et al (1976, p. 56)
70	ALE	Sinclair et al (1976, p. 56)
71	PTERD	This Report
72	REP	Morin et al (1979, p. 39)
73	BROMADROSIS	Morin et al (1977, p. 122)
74	EIRA	Morin et al (1979, p. 35)
75	BLACK IDA	Morin et al (1979, p. 35)
76	JAM	Morin et al (1979, p. 36)
77	STAR	Morin et al (1979, p. 36)
78	COOKER	Morin et al (1979, p. 36)
79	GLEN	Morin et al (1980, p. 10)
80	BONNET	This Report
81	STRIP	This Report
82	RAFE	This Report
83	JOLLY	This Report
84	APE	This Report

KEY MOUNTAIN, TETRAHEDRITE CREEK — Sulphide Vein
Zelon Enterprises Ltd.; Texaco Canada Resources Ltd.
106 C 13, 14 (9,13)
(64°53' - 64°53'N, 133°30' - 133°13'W)

References: Blusson, (1974); D.I.A.N.D. (1981, p. 235).

Claims: BARB 1-8; IOTA 1-112

Source: Summary by K. Grapes from assessment report 090895 by J.H. Hajek.

History:

The IOTA and BARB claims were staked in the fall of 1980 to cover areas with talus mineralization. The IOTA claims cover the headwaters of Tetrahedrite Creek, a tributary of Delores Creek, and the BARB claims are on the east slope of Glacier Pass. Both claim blocks are approximately 190 km northeast of Mayo.

Description:

The claims are underlain by Helikian clastic and carbonate sedimentary rocks. Green (1972) divided these into unit 1: argillite slate, quartzite and dolomite; and unit 2: orange weathering dolomite. Unit 1 on the IOTA claims is brecciated and feldspathized.

Current Work and Results:

In July, 1981, prospecting, mapping, rock sampling and pit excavation were carried out.

Pitting on the IOTA 19 claim revealed a weathered quartz carbonate-sulphide vein. Several samples (10 kg) were collected and assayed for Au, Ag, Cu, Pb and Zn. Best results were 412 ppm Au, 83 ppm Ag, 5.9% Cu, 21.2% Pb and 5.5% Zn. This vein trends northwesterly, is approximately 100 cm in width and is traceable for several metres beneath talus cover. It is mineralized by tetrahedrite, stibnite, galena, sphalerite and arsenopyrite in a quartz-dolomite gangue.

Mineralized float from IOTA 2 assayed up to 2.6 ppm Au, 712 ppm Ag and 5.8% Cu.

Radioactivity up to 30 times background was noted on IOTA 1, 2 and 18 in hematized, weathered and fractured siliceous dolostone.

Copper (1.3%) and cobalt (+1%) mineralization was found on the BARB claims.

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VULCAN	Uranium,
Mountaineer Mines Limited;	Copper Breccia
Aberford Resources Ltd.	106 C 14 (15)
	(64°53'N,133°20'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 223-224); Laznicka and Edwards (1979); Morin et al (1979, p.41; 1980, p.13); Norris (1975).

Claims: ELK 1-90

Source: Summary by K. Grapes from assessment report 090819.

History:

The claims were staked in 1976 to cover a favourable uranium target. During 1977, reconnaissance geological and water geochemical surveys were conducted. Additional geological, water and soil geochemical surveys were done in 1978 and spectrometer and VLF electromagnetic surveys were carried out in 1979.

Description:

The property is underlain by Helikian rocks of the Fairchild Group, siltstone and dolomite and overlying argillite of the Quartet Group. Faulting trends in a northwest direction.

Current Work and Results:

In 1980, prospecting and trenching were carried out. Prospecting revealed a series of northeast trending en echelon fractures in calcareous siltstone mineralized with finely disseminated pyrite and chalcopyrite.

Two trenches were excavated, measuring 7 m by 3 m by 2 m each. One trench exposed a narrow copper-carbonate vein in a limy bleached sandstone. The second trench was cut west across the extrapolated strike of the vein and did not encounter mineralization.

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PROFEIT	Lead, Zinc, Copper
Amax of Canada Limited	106 C 14 (35)
	(64°49'N,133°03'W)

References: D.I.A.N.D. (1981, p. 223); Sinclair et al (1976, p. 57); Sinclair et al (1975, p. 60-61).

Claims: DOC 42, 56

Source: Summary by K. Grapes from assessment report 090869 by M. McGill.

History:

The claims were staked in 1974 as a result of follow-up prospecting on a stream sediment geochemical anomaly.

Description:

The property lies to the north of and straddles Mount Profeit 24 km northeast of Pinguicula Lake. It is underlain by Hadrynian clastics and carbonates which strike north-northwest and dip moderately to the east. Several faults with small displacement occur and northeasterly-trending sheet-jointing and local shearing are present in the area of the main showing.

Current Work and Results:

Two diamond drill holes totalling 306 m were drilled on DOC 42 and 56 claims. Mineralization occurs as galena, sphalerite, pyrite and tetrahedrite in fractures and vugs. Assays of mineralization intersected in the second hole gave values of 0.18% Zn, 9.90% Pb and 142.6 g Ag/t over 2 m.

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OTTER	Cobalt, Nickel
Mountaineer Mines Limited;	Arsenide Veins
Aberford Resources Ltd.	106 C 13 (60)
	(64°59'N,133°47'W)

Reference: D.I.A.N.D. (1981, p. 223-224); Morin et al (1980, p. 11).

Claims: OTTER 1-124

Source: Summary by K. Grapes from assessment report 090817 by D.L. Dick and D.B. Harmeson.

History:

The OTTER claims were staked between August, 1977 and September, 1979 to cover favourable geologic targets.

Description:

The OTTER property covers a series of layered metasedimentary rocks of the Helikian Fairchild and Quartet groups. They are intruded by diatreme breccia pipes flanked by contact alteration halos.

A large regional fault striking north-northwest is associated with the emplacement tectonics of the breccia diatremes.

Current Work and Results:

An intensive prospecting, trenching and diamond drilling program was carried out on the property during 1980.

Massive high-grade cobalt and minor copper mineralization occurs in the central region of the property. Five trenches were excavated in this area uncovering significant vein mineralization of Co, Ni, As, Cu and Ag.

Only one of the four drill holes was completed. Mineralization was not encountered.

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VAL, VERA — Silver, Lead, Zinc
Prism Resources Limited — 106 C 5 (63,64)
(64°18'N,133°44'W)

Reference: D.I.A.N.D. (1981, p. 2, 19, 20-21, 223-235).

Claims: VAL 1-376; VERA 1-164

Source: Summary by K. Grapes from assessment report 090914 by D.F. Penner and assessment report 090923 by G. Sivertz.

History:

The VAL and VERA claims were staked in 1978 following reconnaissance prospecting. Geochemical sampling, mapping, trenching and drilling were conducted during 1978, 1979 and 1980.

Description:

The claims are located on Rusty Mountain, 135 km northeast of Mayo and 25 km northwest of Kathleen Lakes.

Underlying the property is a variety of strata of widely different ages exposed in a series of fault blocks. The fault blocks consist of 1) greenstone (Mississippian?); 2) ankeritic slate and interbedded orange stromatolitic dolomite (Proterozoic); 3) Devonian to Cretaceous black slate overlain by massive greenstone covered by more black slate-argillite and capped with shale and siltstone; 4) thick-bedded limestone; 5) conglomerate and sandstone (Rapitan Group?); 6) orthoquartzite with minor interbedded stromatolitic dolomite and shale; 7) laminated sugary dolomite and orange platy dolomite (Lower Paleozoic?); 8) bright orange stromatolitic dolomite (see D.I.A.N.D. 1981).

Economically interesting quantities of metal occur in fracture-controlled veins on the VERA and VAL claims. Mineralization occurs as sphalerite, galena and tetrahedrite with silver values in a carbonate gangue.

Current Work and Results:

VERA: The 1981 program entailed extensive surface and underground exploration on the East and West shoots of the VERA vein system (formerly called the Gunshot Zone).

A surface diamond drilling program completed 10 holes for a total of 1,152 m. A new vein system was discovered late in 1981 on the south side of Rusty Mountain, about 2 km from the Vera vein portal. Boulders of heavily oxidized material from the vein outcrop assay up to 3,771 g Ag/t.

Underground work included the driving of 495.8 m of drift and four crosscuts totalling 222.1 m, as well as 545 m of diamond drilling.

The 2.7 m by 3.0 m drift was collared on June 1, 1981. Work was suspended on October 4, 1981, although the vein structure was still strong and well mineralized at both the east and west drift faces.

A total of 452.1 cu. m of ore and waste was removed and stockpiled separately. Channel samples across each drift face and 1.87 kg muck samples were taken after each 2.45 m round. A 3,600 kg composite muck sample collected during the drifting, and consisting of 30 kg of muck per round, was submitted for metallurgical testing. Test percussion holes were drilled at 12.5 m intervals along the entire drift.

The deposit contains drill-indicated reserves of 850,000 tonnes grading 306 g Ag/t and 3.7% combined lead-zinc.

VAL: Sixteen holes were drilled on the SILTSTONE showing during 1981 for a total of 1,630 m.

The holes outlined a lens of high-grade material containing 22,500 tonnes averaging 26.7% Pb, 7.3% Zn and 1,029 g Ag/t over a strike length of 50 m.

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ELGEA — Copper, Cobalt
Mountaineer Mines Limited; — 106 C 13 (65)
Aberford Resources Ltd. — (64°59'N,133°55'W)

Reference: D.I.A.N.D. (1981, p. 223, 235)

Claims: EAGLE 1-116

Source: Summary by K. Grapes from assessment report 090817 by D.L. Dick and D.B. Harmeson.

History:

The EAGLE claim group was staked during May, 1980. The group adjoins the OTTER claim group to the east.

Description:

The local host rock is siltstone of Helikian age that is silicified and granitized within a skarn zone near a metadiorite intrusion. Within the skarn, a series of subparallel veins containing massive chalcopyrite, cobaltite, quartz, carbonate minerals and magnetite strike west-northwest and dip moderately to the northeast.

The area is intensely fractured and faulted in various directions.

Current Work and Results:

Activities during 1980 included prospecting, reconnaissance and detailed geological mapping, diamond drilling and trenching.

Showings were found in the east and west walls of the creek. A series of continuous narrow east-west trending fractures with locally, massive cobaltite-erythrite and chalcopyrite-malachite were outlined.

Ten BQ diamond drill holes totalling 1190.7 m were drilled. Four of the holes (564.94 m) delineated two zones of mineralization. The upper zone at the boundary of siliceous and calcareous metasiltstone is primarily chalcopyrite, pyrrhotite, pyrite, minor galena and cobaltite as blebs and disseminations. The lower zone is within the metasiltstone breccia greissen and consists of oxidized blebs, fracture fillings and very fine crystals of arsenopyrite, pyrite, chalcopyrite and skutterudite.

Four more holes (418.18 m) were drilled to test the malachite and erythrite showings on the creek banks. All holes intersected massive bands and fracture stringers of pyrrhotite, chalcopyrite and pyrite in metasiltstone and meta-argillite.

Two holes (207.57 m) were drilled to test the sub-surface extent of overburden anomalies but no significant mineralization was intersected.

Two trenches were blasted. One uncovered an erythrite-cobaltite vein and abundant malachite staining and the other a 15.2 cm wide calcite-erythrite vein and a narrow malachite-azurite vein in highly fractured metasiltstone.

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<u>TARA</u> Zinc, Lead
Prism Resources Limited 106 C 2 (66)
(64°13'N,132°56'W)

References: Blusson (1974); Morin <u>et al</u> (1977, p. 118); Sinclair <u>et al</u> (1976, p. 39).

Claims: NADALEEN 1-16

Source: Summary by K. Grapes from assessment report 090990 by G. Sivertz.

History:

The ground covered by the NADALEEN 1-16 claims was originally part of the TARA claim block, staked by McIntyre Mines in 1975. McIntyre Mines conducted geochemical sampling, trenching, 743 m of BQ and 74 m of EXT diamond drilling.

Description:

The property is located on the southeastern flank of Nadaleen Mountain approximately 175 km east-northeast of Mayo.

The claims are underlain by a west-dipping Proterozoic sequence of grey carbonates which grade upward into white crystalline dolomite and mudstone.

Massive galena-barite-(sphalerite) forms pods and blebs up to several metres square in white crystalline dolomite immediately underlying the mudstone sequence.

Current Work and Results:

Work conducted on the claims in 1981 included prospecting, mapping, soil sampling and reopening the old McIntyre Mines trenches.

Ninety-one soil samples were taken at 25 m intervals and analyzed for Cu, Pb, Zn and Ag. Results indicate that areas underlain by white dolomite near the mudstone-dolomite contact on NADALEEN 11, 12, 13 and 14 are anomalous in lead and zinc (greater than 100 ppm Pb and greater than 1,000 ppm Zn).

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<u>PTERD</u> Uranium
Archer, Cathro and Associates Limited 106 C 14 (71)
(64°57'N,133°18'W)

References: Blusson, (1974); Morin <u>et al</u> (1977, p. 124); Sinclair <u>et al</u> (1976, p. 58).

Claims: PTERD 1-14; PNERD 1-4; KNIT 1-26; PTOES 1-22; SKIN 1-4

Source: Summary by K. Grapes from assessment report 090965 by D. Eaton.

Current Work and Results:

The 1981 exploration program included additional geological mapping and prospecting, a radiometric survey and 607 m of diamond drilling in three BQ holes.

The radiometric survey using a Saphyrmo-Stel SSP2 scintillometer indicated that:

a) most of the pitchblende float appears to be derived from the south and southwest corner of the cirque.
b) radioactive rocks are argillites containing pitchblende in fractures and matrix, and exhibit alteration ranging from weak chloritization to intense bleaching.
c) these are two sources of mineralization, one a bleached moderately-radioactive zone surrounding an east-trending, steeply-dipping fault, the other a narrow carbonate and hematite altered zone on the margin of a breccia body.
d) the radioactive float train extends beneath non-radioactive talus on the west side of the cirque.

Three BQ holes were drilled from a single site on the "PTERD" glacier near the head of the radioactive float train. The targets were not intersected as all three holes had to be abandoned due to glacial ice shifting.

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JOLLY
Archer, Cathro and Associates Limited; Wernecke Joint Venture

Lead, Zinc Vein
106 C 13 (83)
(64°48'N,133°54'W)

Claims: JOLLY 1-10

Source: Summary by K. Grapes from assessment report 090966 by D. Eaton.

History:

The JOLLY property was staked by the Wernecke Joint Venture (Chevron Canada Limited and Aquitaine Company of Canada Limited) in June, 1981 to protect a series of pyrite, galena and sphalerite-bearing veins.

Description:

The JOLLY claims are located 165 km northeast of Mayo. Access is by float-equipped plane to Gillespie Lake, nine km southwest, or by fixed wing to the airstrip on the Bear River, 18 km to the west.

The claims are underlain by a thick section of Helikian orange weathering, stromatolitic and cherty dolomites unconformably overlain by a thin layer of grey-green to maroon Hadrynian shales and capped by orange to red-brown weathering dolomite and limestone.

A series of northeast-striking and steeply dipping shear zones, one to three m wide, cutting the older dolomites, host lead-zinc mineralization.

The breccia mineralization is predominantly pyrite with lesser galena and sphalerite in the matrix surrounding dolomite fragments.

Current Work and Results:

The 1981 exploration program included prospecting, mapping and stream sediment, soil and rock geochemical sampling.

Stream sediment samples collected below mineralized veins returned strongly anomalous values for lead (up to 870 ppm), zinc (up to 2,600 ppm), silver (up to 4.0 ppm) and copper (up to 225 ppm). Background values average 40 ppm lead, 200 ppm zinc, 0.1 ppm silver and 30 ppm copper.

Three grab samples and two chip samples of sulphide-bearing vein material from three veins returned assays ranging from 0.18% to 33.6% Pb, 0.06% to 6.52% Zn and 0.2 ppm to 44.6 g Ag/t.

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APE
Archer, Cathro and Associates Limited; Wernecke Joint Venture

Uranium
106 C 13 (84)
(64°53'N,133°58'W)

Claims: APE 1-24

Source: Summary by K. Grapes from assessment report 090967 by D. Eaton.

History:

The APE claims were staked in May, 1981 by the Wernecke Joint Venture (Chevron Canada Limited and Aquitaine Company of Canada Limited). A portion of the property had been staked by Noranda Exploration Company Limited in 1976 as a uranium prospect; the claims were allowed to lapse in 1978.

Description:

The claims are located 175 km northeast of Mayo. Fairchild Lake, suitable for float-equipped aircraft, is located 11 km to the northeast, and an airstrip on the Bear River is 17 km to the southwest of the property.

The property is underlain by several fault blocks of lower Proterozoic metasedimentary rocks cut by Helikian heterolithic breccia bodies. The oldest rocks, pale green phyllite and spotted schist, are unconformably overlain by black argillite and siltstone interbedded with light grey quartzite and orange weathering stromatolitic dolomite. The pale green altered argillite is common adjacent to breccia bodies and along faults.

Pitchblende-filled, hairline fractures parallel the cleavage in the spotted phyllite and interbedded slate, argillite and quartzite. Brannerite in one mm to one cm blebs occur in the heterolithic breccia. Some of the pitchblende-bearing samples have returned assays of up to 0.68% Mo.

Pyrite, chalcopyrite and traces of cobaltite occur in siderite, ankerite and quartz veins in open fractures along breccia margins and faults. The veins rarely exceed a few metres in width, or a few tens of metres in length and usually contain one to five per cent chalcopyrite and trace to 0.2% cobaltite.

Current Work and Results:

Geological mapping, prospecting, geochemical and radiometric grid surveys and chip sampling programs were conducted on the claims in 1981.

Reconnaissance sampling of rock and soil on talus-covered lower slopes indicates a moderate correlation between copper and cobalt. The geochemical and radiometric surveys and chip sampling were conducted on a grid covering a 0.5 sq. km area. Soil and/or rock fragments were collected at 50 m intervals, and radiometric readings were taken every 25 m. One hundred and forty three (143) molybdenum analyses ranged from one to 155 ppm with a mean of 4.8 ppm. A correlation between molybdenum and higher than background radioactivity was indicated.

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1981 MINERAL CLAIMS STAKED

TARA
Prism Resources Limited
106 C 2 (66)
(64°13'N,132°55'W)

Claims 1981: NADALEEN (16)

STRIP
Prism Resources Limited
106 C 3 (81)
(64°13'N,133°12'W)

Claims 1981: STRIP (3)

RAFE
K. Hepner et al
106 C 5 (82)
(64°17'N,133°53'W)

Claims 1981: RAFE (19)

JOLLY
Archer, Cathro and Associates Limited
106 C 13 (83)
(64°47'N,133°52'W)

Claims 1981: JOLLY (10)

APE
Archer, Cathro and Associates Limited
106 C 13 (84)
(64°52'N,133°58'W)

Claims 1981: APE (24)

BONNET
Zelon Enterprises Limited
106 C 13 (80)
(64°53'N,133°31'W)

Claims 1981: BARB (4)

TETRAHEDRITE CREEK
Zelon Enterprises Limited
106 C 14 (13)
(64°55'N,133°13'W)

Claims 1981: IOTA (92)

PROFEIT
Amax of Canada Limited
106 C 14 (35)
(64°49'N,133°02'W)

Claims 1981: DOC (30)

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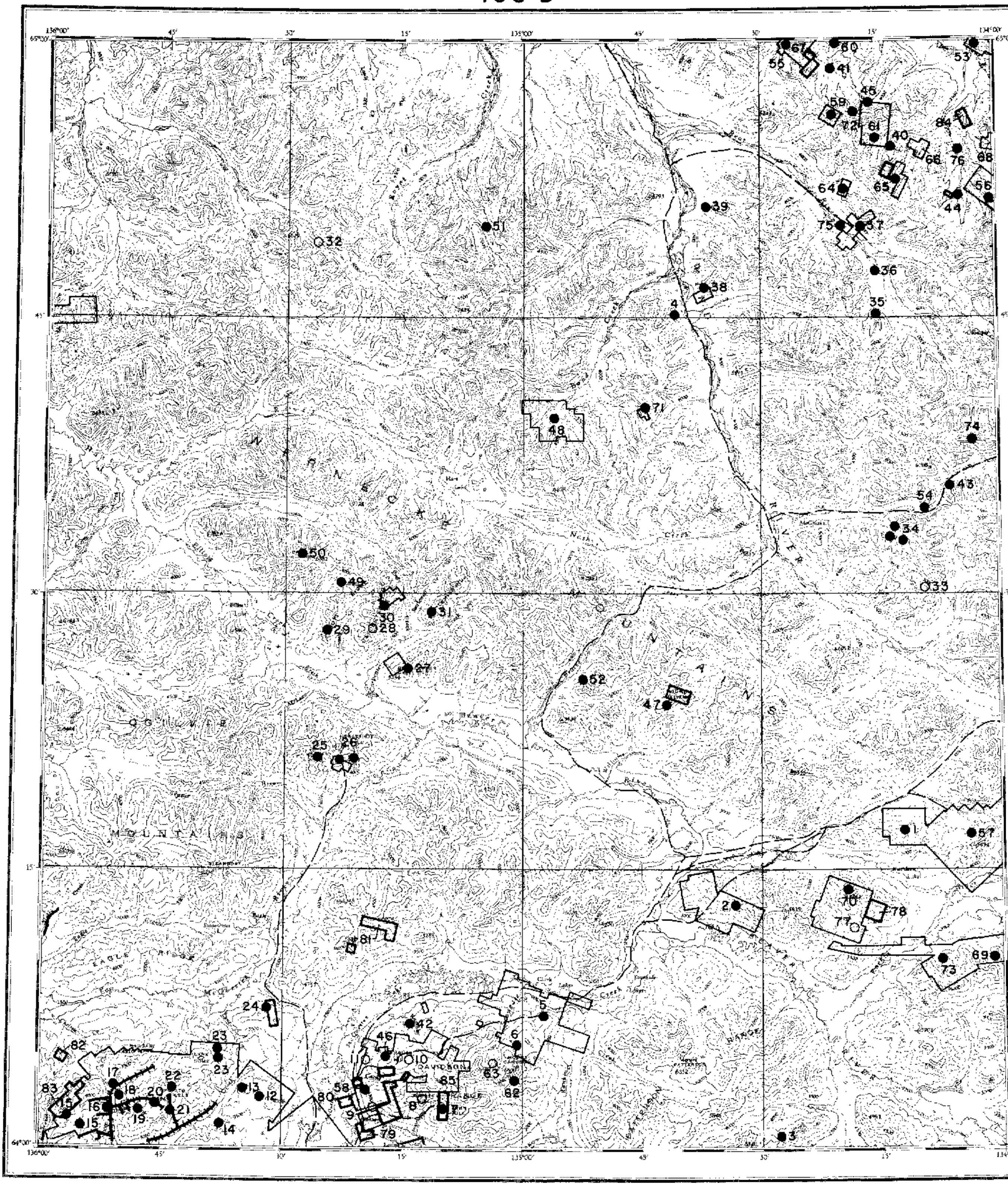
106 D



NASH CREEK

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 .... Mineral Deposit or Occurrence see key on facing page

○ 72 .... Unmineralized Target

.......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

......Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL........Coal Exploration Licence

CML........Coal Mining Lease

.....Tote Trail

.....Driveable Road

..........Oil or Gas Well

.........Airstrip

NASH CREEK MAP-AREA (NTS 106 D)

General Reference: GSC Map 1282A and Memoir 364 by: L.H. Green, 1972. GSC Open File 710 by: M.P. Cecile, 1980.

NO.	PROPERTY NAME	REFERENCE
1	KATHLEEN	Green (1972, p. 132); This Report
2	NOW	D.I.A.N.D. (1981, p. 238)
3	MARG	Lead-Zinc-Silver-Copper Strata-bound
4	WEN	Green (1972, p. 139)
5	CLARK	Sinclair & Gilbert (1972, p. 15-16); Craig & Laporte (1972, p. 19-20)
6	CAMERON	Green (1971, p. 63-64); Sinclair et al (1975, p. 16-17)
7	STAND-TO	Findlay (1969b, p. 13-14); This Report
8	FORBES	Cockfield (1922)
9	SPRING	Craig & Milner (1975, p. 30); This Report
10	RAMBLER	Cockfield (1922, p. 4-5); D.I.A.N.D. (1981, p. 244); Green (1971, p. 63)
11	RUSTY	
12	ERIN	Craig & Laporte (1972, p. 16-17)
13	GWAIHIR	D.I.A.N.D. (1981, p. 238)
14	SKATE	This Report
15	PESO	Green (1965, p. 20-22); D.I.A.N.D. (1981, p. 244)
16	BARKER	Boyle (1965, p. 84)
17	MEILECKE	Silver-Lead Vein
18	SHEPPARD	Mulligan (1975, p. 73-74)
19	DUBLIN GULCH	This Report
20	POTATO HILLS	Little (1959, p. 21-29, 34-36); Craig & Milner (1975, p. 24-25)
21	RAY GULCH	D.I.A.N.D. (1981, p. 240)
22	ELLIS	Green & Godwin (1963, p. 15)
23	LYNX	Green & Godwin (1963, p. 15); D.I.A.N.D. (1981, p. 244)
24	LUCKY STRIKE	Green (1972, p. 137); This Report
25	WHITE HILL	Cockfield (1925, p. 1-18)
26	McKAY HILL	Cockfield (1924, p. 22-28); D.I.A.N.D. (1981, p. 244); Green (1972, p. 133-134)
27	GREY COPPER HILL	D.I.A.N.D. (1981, p. 240)
28	CARPENTER	Cockfield (1925, p. 1-18)
29	ELLIOTT RIDGE	Cockfield (1925, p. 1-18)
30	SILVER HILL	Cockfield (1925, p. 1-18); Green (1972, p. 133)
31	SETTLEMEIR	
32	ROYAL	
33	ZULPS	Copper Vein
34	McCLUSKY	Copper Occurrence
35	GRAY	Findlay (1969a, p. 16)
36	NEW JERSEY	Findlay (1969a, p. 16)
37	PAGISTEEL	Findlay (1969a, p. 28-30); Green (1972, p. 142-143); This Report
38	AHEARNE	Green (1972, p. 139)
39	FRAN	Green (1972, p. 143)
40	FORD	Copper-Lead Vein
41	SLATS	Copper Vein
42	JEE	
43	DRESEN	Copper Vein
44	FOUND	Copper Vein; This Report
45	BUT	Copper Vein
46	NAT	Lead-Silver-Zinc-Copper Vein; This Report
47	BRAINE	Green (1972, p. 139); This Report
48	BOND	Green (1972, p. 139)
49	LINGHAM	Lead-Zinc Vein
50	NEWT	Lead-Zinc Vein
51	SIHOTA	Copper-Zinc Vein
52	CLOUTIER	Lead-Zinc-Silver-Copper-Gold Vein
53	SLAB	Findlay (1969b, p. 17-18)
54	LOUIE	Copper Vein
55	EATON	This Report
56	CORD	D.I.A.N.D. (1981, p. 241); This Report
57	ZAP	D.I.A.N.D. (1981, p. 241)
58	J.T.	D.I.A.N.D. (1981, p. 241)
59	ARCTOS	This Report
60	RAD	This Report
61	URSUS	This Report
62	SPRING	D.I.A.N.D. (1981, p. 244)
63	DEAL	D.I.A.N.D. (1981, p. 244)
64	FACE	This Report
65	ADUB	This Report
66	HAIL	This Report
67	PIK	D.I.A.N.D. (1981, p. 244); This Report
68	SNOW STAR	This Report
69	ROD	D.I.A.N.D. (1981, p. 242)
70	BLUE LITE	D.I.A.N.D. (1981, p. 243-244)
71	BOZO	Sinclair et al (1976, p. 62)
72	GNUCKLE	Morin et al (1977, p. 125)
73	BAG	Morin et al (1980, p. 13)
74	JAZ	Morin et al (1979, p. 43)
75	PITCH	Morin et al (1979, p. 44)
76	SER	Morin et al (1979, p. 45)
77	KATHY	Morin et al (1980, p. 14)
78	LEEN	This Report
79	D. BURKE	This Report
80	SHARON	This Report
81	BREFAULT	This Report
82	KISS	This Report
83	COLLEEN	This Report
84	SAM	This Report
85	FOHU	This Report

KATHLEEN
Pan Acheron Resources Ltd.

Zinc, Silver, Lead
106 D 8 (1)
(64°15'N,134°15'W)

Reference: D.I.A.N.D. (1981, p. 237); Green (1972, p. 132); Morin et al (1980, p. 15)

Claims: BUD 1-28; DAGO 3 and 5; SCOTTY 1-32

Source: Summary by K. Grapes from assessment report 090811 by R.H.D. Philp.

History:

Since 1951, mineral showings on the property have received extensive exploration attention, including bulldozer trenching, and diamond drilling by three different companies (see Morin et al, 1979, p. 43).

Pan Acheron Resources Ltd. optioned the property in 1977. During 1977-78, geochemical soil surveys, geological mapping and diamond drilling programs were conducted. Twenty two holes (BQ) were drilled totalling 1,559 m.

Description:

The property is located in the Wernecke Mountains, 115 km northeast of Mayo and 5 km north of Kathleen Lakes.

The claims are underlain by a west-northwest trending sequence of dolomite and dolomitic shale of Proterozoic age that is overlain by limestone and dolomite of Ordovician age.

Current Work and Results:

The 1980 field program consisted of geological mapping on the BUD and SCOTTY claims at a scale of 1:12,000.

On the BUD and DAGO claims, zinc with minor silver and lead occurs in breccia zones of orange weathering dolomite. The mineralized zone has been traced for over 1,100 m along a northeast trend and within the area drilled (approximately 175 m) shows an average grade of 3 to 5% Zn, 0.2 to 0.5% Pb and 17 ppm Ag.

Several mineral showings were found associated with the unconformable grey limestone - orange dolomite contact.

Minor galena is associated with breccias in the upper limestone unit, and with chalcopyrite in sandy coarse crystalline dolomite. Sphalerite occurs in thin bands in orange weathering dolomite.

******

SKATE
Tally Resources Inc.

Lead, Zinc, Silver
106 D 4 (14)
(64°01'N,135°37'W)

Reference: D.I.A.N.D. (1981, p. 237); Green (1966, p. 16-17).

Claims: LEN 1-32

Source: Summary by K. Grapes from assessment report 090813 by R.H.D. Philp.

History:

The property was originally investigated by United Keno Hill Mines Limited who trenched a galena-siderite vein and subsequently allowed the claims to lapse.

In 1968, Altair Mining Corporation Ltd. (N.P.L.) staked the JAY claims and carried out a soil geochemical survey which outlined an east-west trending anomaly in Pb, Zn and Ag.

In 1973-74, Belmoral Mines Ltd. mapped, trenched and drilled 6 EXT holes totalling 71 m.

The JAY claims were allowed to lapse in 1974 and were subsequently staked as the LEN claims by Gordon Dickson of Whitehorse. These are currently under option to Tally Resources Inc. of Vancouver, B.C.

Description:

The claims are underlain by quartzite, quartz-mica schist and limestone. Granitic intrusions of Cretaceous age form small stocks in the west-central and southeastern parts of the LEN claims.

The main showing is a northwest striking, 61 m long vein with an apparent width of 10.7 m on surface, and a true width of 2.7 m. The vein material is coarsely crystalline, strongly oxidized siderite with narrow stringers and veinlets of galena. Samples across the vein average 394 ppm Ag, 4.98% Pb, 5.05% Zn and 0.48 ppm Au, from sampling reported in 1973.

Current Work and Results:

During May and June, 1980, geological mapping, stream sediment and soil geochemical surveys were carried out.

Geological mapping failed to turn up any new showings, but did locate a granodiorite stock not previously mapped.

A total of 245 silt samples were taken at 60 m intervals along the creeks. All samples were tested for Ag, Pb and Zn. A total of 797 soil samples were collected at 50 m intervals along a grid and analyzed for Ag, Pb and Zn.

Small Ag-Pb-Zn highs correspond to the previously explored mineralization. A significant silver-lead anomaly occurs east of the mineralized zone. No significant tin or tungsten anomalies were outlined.

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DUBLIN GULCH
Canada Tungsten Mining Corporation Limited; Queenstake Resources Limited

Tungsten Skarn
106 D 4 (19)
(64°02'N,135°50'W)

References: Boyle (1965, p. 82-83); D.I.A.N.D. (1981, p. 7, 19, 23-29, 237-239); Morin (1981, in D.I.A.N.D., 1981, p. 68, 74-79); MacLean (1914, p. 127-157).

Claims: ALEC 1-60; BOB 1-73; C.J. 1-200; DAVE 1-24; D.G. 1-56; JEFF 1-112; MAR 1-30; MOLE 1-18; R.D. 1-16; SMOKY 1-82; WEASEL 1-210; and fractions

Source: Summary by K. Grapes from assessment report 090915 by G.M. Rodgers.

History:

Placer gold was discovered in Haggart Creek and Dublin Gulch in 1898 and 1899. It was not until 1904 that scheelite was identified in the placer deposits. The early history of the area is detailed in MacLean 1914 and Cairnes 1915.

The MAR claims were staked by Queenstake Resources Limited in 1977 and were optioned to Canada Tungsten Mining Corporation Limited during the summer of 1978. Encouraging results from the 1978 field program led to 21 BQ diamond drill holes totalling 2,422 m in 1979 and 11,315 m of NQ and BQ core drilling in 1980.

Description:

Dublin Gulch is located approximately 40 km northeast of Mayo.

The Dublin Gulch area includes a cluster of Cretaceous granitic intrusives in phyllite, quartzite, marble and quartz-mica schist. Along the south side of Dublin Gulch, several east to northeast-trending quartz-arsenopyrite (sulphosalt) veins occur along fractures in metasedimentary rocks on the west side of the Potato Hills granodiorite stock.

Current Work and Results:

A program of regional geological mapping, trenching, soil sampling and heavy mineral geochemical analyses was conducted in 1981.

Mapping was conducted on a scale of 1:5,000, 1:25,000 and 1:50,000 over the entire claim and 1:1,000 over mineralization. Mapping confirmed that the scheelite-mineralized zone lies within the Grit Unit and is more extensive than previously reported.

Seven kg samples of the -10 mesh fraction were collected from all major drainages within the Dublin Gulch claim group and analyzed for their heavy mineral content. The results indicate that all Dublin Gulch pups are anomalous in tungsten and gold.

Rock geochemistry has delineated areas anomalous in tin south of Ironrust Creek on Tin Dome and near the mouth of Gill Gulch (local names).

Trenching was carried out in late September on the eastern margin of the 1979-80 drill zone. Assays of rock from the trench range from 0.1% to 0.99% WO_3.

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PAGISTEEL, ADUB
HAIL, SNOWSTAR
Zelon Enterprises Ltd.;
Texaco Canada Resources Ltd.

Uranium
106 D 16 (37,65 66,68)
(64°50' - 64°59'N 134°00' -134°17'W)

References: Delaney (1978); D.I.A.N.D (1981, p. 237, 244); Laznicka and Edwards (1979); Yeo et al (1978).

Claims: IRON 1-30; ADUB 1-18; HAIL 1-12; JUDY 1-2; SNOWSTAR 1-8

Source: Summary by K. Grapes from assessment report 090868 by J.H. Hajek.

History:

The IRON, ADUB, HAIL, JUDY and SNOWSTAR claims were staked in 1980 to cover airborne radiometric anomalies.

Description:

The claims are located in the Wernecke Mountains and are accessible by winter cat road from Mayo and McQuesten Lake.

The properties are underlain by sedimentary rocks of the Fairchild and Quartet Groups. Uranium, gold and cobalt mineralization occurs in iron-rich breccia pipes which intrude the sedimentary rocks.

Current Work and Results:

A reconnnaissance airborne radiometric survey with follow-up prospecting, rock geochemical survey, scintillometer survey and trenching was conducted during the summer of 1980.

Iron-rich breccia intrusions were found on all claim blocks. Grab samples of the breccias from the HAIL claims ran 0.2% to 0.5% U_3O_8.

Three pits were blasted on the IRON claims. Grab samples of breccia from the pits ran 0.04% U_3O_8 and chip sampling over one metre gave a value of 0.17% U_3O_8. Three pits, all approximately one cu. m and a trench totalling two cu. m, were excavated on the ADUB claims. Samples analyzed returned values of 2.5 ppm Au and 310 ppm Co.

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BRAINE
Archer, Cathro and Associates Limited

Zinc, Lead, Copper
106 D 7 (47)
(64°24'N,134°42'W)

References: D.I.A.N.D. (1981, p. 237); Green (1972); Sinclair et al (1976, p. 60).

Claims: BLENDE 1-15

Source: Summary by K. Grapes from assessment report 090998 by D. Eaton and A. Archer.

History:

The BLENDE claims were staked in March, 1981 to cover a lead-zinc vein occurrence previously staked as the WILL claims by Cyprus Anvil Mining Corporation in July, 1975. (Sinclair et al, 1976).

Description:

The claims are located on Mt. Williams, 65 km northwest of Elsa. A winter road (Wind River Trail) extends north from Elsa to within 11 km of the property.

The BLENDE veins are hosted by orange-weathering dolomite of the Helikian Gillespie Lake Group. (See Sinclair et al, 1976).

Current Work and Results:

The 1981 field season consisted of mapping and soil, stream sediment and rock geochemistry programs.

Seven rock samples were collected from the No. 5 vein and assayed for Zn, Pb and Ag. Brecciated dolomite assayed 6.10% Zn, 3.34% Pb and 60.3 g Ag/t. Vein gouge with no visible sulphide assayed up to 7.16% Zn, 3.34% Pb and 75.4 g Ag/t over 2 m. A grab sample of sphalerite-rich talus ran as high as 22.20% Zn, with 0.71% Pb and 28.8 g Ag/t, and a galena-rich talus sample assayed 9.30% Zn, 38.60% Pb and 1,177.3 g Ag/t.

Soil sampling has located several anomalous areas (greater than 200 ppm Pb) peripheral to the main zone.

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EATON
Archer, Cathro and Associates Limited; Wernecke Joint Venture

Copper, Uranium
Breccia
106 D 16,
106 E 1 (55)
(65°00'N,134°26'W)

Reference: D.I.A.N.D., (1981, p. 237, 240-241).

Claims: PIKE 1-7, 15-51, 55-108

Source: Summary by K. Grapes from assessment report 090969 by D. Eaton.

Description:

The claims lie west of the Bonnet Plume River, 175 km north-northeast of Mayo.

The property is underlain by the margin of an irregular, heterolithic breccia approximately two km across which cuts black shale, argillite and quartzite of the Helikian or older Quartet Group.

Brannerite has been found in a few small float boulders of barite and quartz. High-grade samples assayed up to 6.57% U_3O_8.

Current Work and Results:

In 1981, the Wernecke Joint Venture program consisted of reanalysis of old samples, geological mapping, prospecting, extensive contour controlled geochemical and radiometric surveys, reconnaissance chip sampling and hand trenching.

The results of the soil geochemical survey are tabulated below:

Metal	Maximum	Minimum	Mean	Standard Deviation
Ag	1.5	0.1	0.2	0.2
U	21	0.5	3.3	2.9
Cu	8,200	1	125.3	526.8
Mo	28	1	1.7	2.3
Pb	154	1	7.7	11.8
Co	275	3	29.7	27.9
As	345	2	11.6	20.3
Bi	4.0	0.1	0.4	0.5

Geochemistry outlined an anomalous area 1,500 m by 800 m in the center of the property associated with the margin of a large breccia body.

Two trenches were excavated on the radioactive, quartz float train, but neither reached bedrock.

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CORD
Riocanex Inc.

Lead, Zinc
Stratiform
106 D 16, C 13 (56)
(64°52'N, 134°00'W)

References: D.I.A.N.D. (1981, p. 237, 241); Morin et al (1979, p. 39-40).

Claims: CORD 1-54; OVERBURDEN 1-4

Source: Summary by K. Grapes from assessment report 090996 by J.L. Hardy and C.J. Campbell.

Current Work and Results:

In 1981, a short program of detailed EM surveying and diamond drilling was carried out. A total of 365.7 m was completed in four holes, of which only two penetrated to the desired depth, intersecting a sequence of siliceous mudstone and siltstone with pyrite, up to one m in thickness, and lesser thicknesses of recrystallized iron, lead, copper and zinc sulphides. The best grades obtained were 0.05% Cu, 0.50% Pb, 0.63% Zn and 3.8 g Ag/t over 2.0 m.

The EM survey, over 3.21 km, did not delineate any significant new anomalies. Chip samples collected yielded values of up to 0.87 Zn, 0.35% Pb and 1.3 g Ag/t over 2.5 m.

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ARCTOS
Mountaineer Mines Limited; Aberford Resources Ltd.

Uranium, Copper, Cobalt, Silver
Breccia
106 D 16 (59)
(64°56'N,134°21'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 237, 242); Morin et al (1977, p. 101-107; 1979, p. 44; 1980, p. 16).

Claims: ARCTOS 1-16

Source: Summary by K. Grapes from assessment report 090821 by D.L. Dick and D.B. Harmeson.

History:

The claims were staked in 1976 following discovery of copper-uranium-cobalt mineralization during a prospecting survey. During 1977 to 1979, stream water and rock chip geochemical sampling, geological mapping and trenching were carried out on the property.

Description:

The ARCTOS claims are approximately 188 km northeast of Mayo. They are underlain by Helikian sedimentary rocks of the Quartet and Gillespie groups. Zones of brecciation occur in the central region of the claim block.

The overall regional trend strikes northwest and dips to the southwest. The primary structural feature appears to be complex block faulting.

A number of fracture-controlled, spotty uranium (brannerite), cobalt, barite and copper showings have been located.

Current Work and Results:

During August, 1980, a trenching program was conducted to follow up on trenching work carried out in 1978 and 1979.

Two trenches were blasted in 1978 and 1979 to trace narrow shear zones. The 1980 trench was blasted along trend of these to determine the continuity of the vein. It measured 6 m long by 2 m deep and exposed the vein. Samples gave values of up to 500 ppm Cr, 1,000 ppm Co, 2,000 ppm Cu, 10 ppm Pb, 150 ppm Ni and 3 to 775 ppb Au, and greater than 5,000 ppm Ba.

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RAD
Mountaineer Mines Limited;
Aberford Resources Ltd.

Uranium, Copper,
Gold Breccia
106 D 16,
106 E 1 (60)
(65°00'N,134°20'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 237, 242); Morin et al (1979, p. 48; 1980, p. 17).

Claims: RAD 1-24; BREAK 1-32

Source: Summary by K. Grapes from assessment report 090820 by D.L. Dick and D.B. Harmeson.

History:

The RAD and BREAK claims were staked in 1976. Preliminary geological mapping was carried out from 1977 to 1978. A water geochemical survey was conducted in 1979.

Description:

The property is underlain by Helikian age rocks of the Fairchild and Quartet Groups that locally host copper mineralization.

Current Work and Results:

Geological mapping and trenching were carried out in August, 1980.

One trench measuring 9.6 m long by 3 m wide by 4.2 m deep was excavated over a copper mineralized vein swarm in interbedded grey quartzite and argillite. Mineralization in the trench is massive to finely disseminated chalcopyrite and pyrite in the quartzite and quartz-breccia veins as well as localized pods of massive chalcopyrite. Trench sample assays are slightly enriched in gold.

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URSUS
Mountaineer Mines Limited;
Aberford Resources Ltd.

Uranium, Copper,
Silver Breccia
106 D 16 (61)
(64°55'N,134°15'W)

References: Bell and Delaney (1977); D.I.A.N.D. (1981, p. 237, 242, 244); Morin et al (1977, p. 101-107; 1979, p. 44; 1980, p. 16).

Claims: URSUS 1-66

Source: Summary by K. Grapes from assessment report 090818 by D.L. Dick and D.B. Harmeson.

History:

The original URSUS 1-24 mineral claims were staked in 1976 to investigate copper and uranium showings. In July, 1980, an additional 41 claims were staked. Prospecting, geological mapping and geophysical surveys were carried out between 1977 and 1979.

Description:

The URSUS claims are located approximately 188 km northeast of Mayo, 10 km north of the Bear River airstrip.

The property is underlain by moderately metamorphosed and structurally complex rocks of Helikian age: fine-grained clastic sediments with interbedded carbonates (Fairchild Group) and orange-weathering dolomite (Gillespie Group). Faulting is common and breccia intrusion was accompanied by folding, shearing and metasomatism. Uranium and copper mineralization is associated with the breccias and their related alteration zones.

Current Work and Results:

During the 1980 field season, prospecting, geological mapping, geochemistry, geophysics and trenching were carried out.

A number of copper and uranium showings occur within a bed of siltstone that trends east-west through the center of the property. The showings are either associated with breccia bodies or their alteration halos. Most appear to occur near the contact with overlying phyllite in isolated feldspathized pods within the breccias and/or altered siltstone. Mineralization occurs as chalcopyrite and brannerite, where brannerite occurs along minor shears, and fractures.

Four trenches totalling 46.2 cu. m were excavated on the north side of the ridge (URSUS 44) within a geochemically anomalous northwest-trending linear zone. Rock samples analyze up to 120 ppm Mo, 50 ppm Zn, 70 ppm Ni, 1300 ppm Co and up to or greater than 10,000 ppm Cu, 5,000 ppm Ba and 2,500 ppm U.

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FACE
Archer, Cathro and
Associates Limited;
Wernecke Joint Venture

Uranium
106 D 16 (64)
(64°50'N,134°20'W)

References: D.I.A.N.D. (1981, p. 237, 244); Morin et al (1977, p. 103, 126; 1980, p. 17).

Claims: FACE 1-8

Source: Summary by K. Grapes from assessment report 090968 by D. Eaton.

History:

The claims were staked by Eldorado Nuclear in July, 1976 to cover a uranium float occurrence (see Morin et al 1980). Prior to the 1981 field season, all samples were reanalyzed for several elements, including cobalt, arsenic, antimony, bismuth and silver. A pitchblende and chalcopyrite-bearing float specimen, which previously assayed 2.15% U_3O_8 and 0.4% Cu, was found to contain 100 ppm Ag.

Current Work and Results:

The 1981 field program included geological mapping, prospecting, reconnaissance soil geochemical sampling and hand trenching.

The only high soil geochemical values were obtained below known mineral occurrences. Values range from, less than 0.5 to 5.0 ppm U with a mean of 23 ppm U; 6 to 590 ppm Cu with a mean of 48.7 ppm; less than 1 to 22 ppm Mo with a mean of 2.4 ppm; 0.1 to 0.4 ppm Ag with a mean of 0.1 ppm and 6 to 22 ppm As with a mean of 13 ppm.

Five hand-trenched pits were excavated, two uphill from the 1978 pits and three in an area where chalcopyrite float was discovered. The two pits excavated uphill from the 1978 pits revealed only background radiometric readings and values. The other three pits exposed minor chalcopyrite-bearing float.

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1981 MINERAL CLAIMS STAKED

LEEN — 106 D 1 (78)
R. Riedel — (64°13'N,134°16'W)

Claims 1981: LEEN (16)

STAND-TO — 106 D 3 (7)
D. Hutton; T. Hutton — (64°02'N,135°10'W)

Claims 1981: DO (8); TE (4)

SPRING — 106 D 3 (9)
Western Mines Limited — (64°02'N,135°16'W)

Claims 1981: HL (32)

D. BURKE — 106 D 3 (79)
G. Rattray — (64°00'N,135°19'W)

Claims 1981: D. BURKE (8)

SHARON — 106 D 3 (80)
D. McWilliams — (64°02'N,135°22'W)

Claims 1981: SHARON (6)

NAT — 106 D 3 (46)
B. Rapts — (64°04'N,135°17'W)

Claims 1981: RAP (8)

BREFAULT — 106 D 3 (81)
B. O'Neill; McCrory Holdings — (64°12'N,135°18'W)

Claims 1981: BREFAULT (24)

LUCKY STRIKE — 106 D 4 (24)
J.B. O'Neill et al — (64°07'N,135°31'W)

Claims 1981: J.A. (12)

KISS — 106 D 4 (82)
P. Kiss — (64°04'N,135°58'W)

Claims 1981: KISS (4)

COLLEEN — 106 D 4 (83)
Mattagami Lake Exploration — (64°02'N,135°57'W)

Claims 1981: COLLEEN (40)

BRAINE — 106 D 7 (47)
Archer, Cathro and Associates Limited — (64°24'N,134°11'W)

Claims 1981: BLENDE (15)

PIK — 106 D 16 (67)
Archer, Cathro and Associates Limited — (64°58'N,134°23'W)

Claims 1981: PIKE (76)

SAM — 106 D 16 (84)
Zelon Enterprises — (64°55'N,134°04'W)

Claims 1981: SAM (8)

ADUB — 106 D 16 (65)
Zelon Enterprises — (64°52'N,134°12'W)

Claims 1981: ADUB (5)

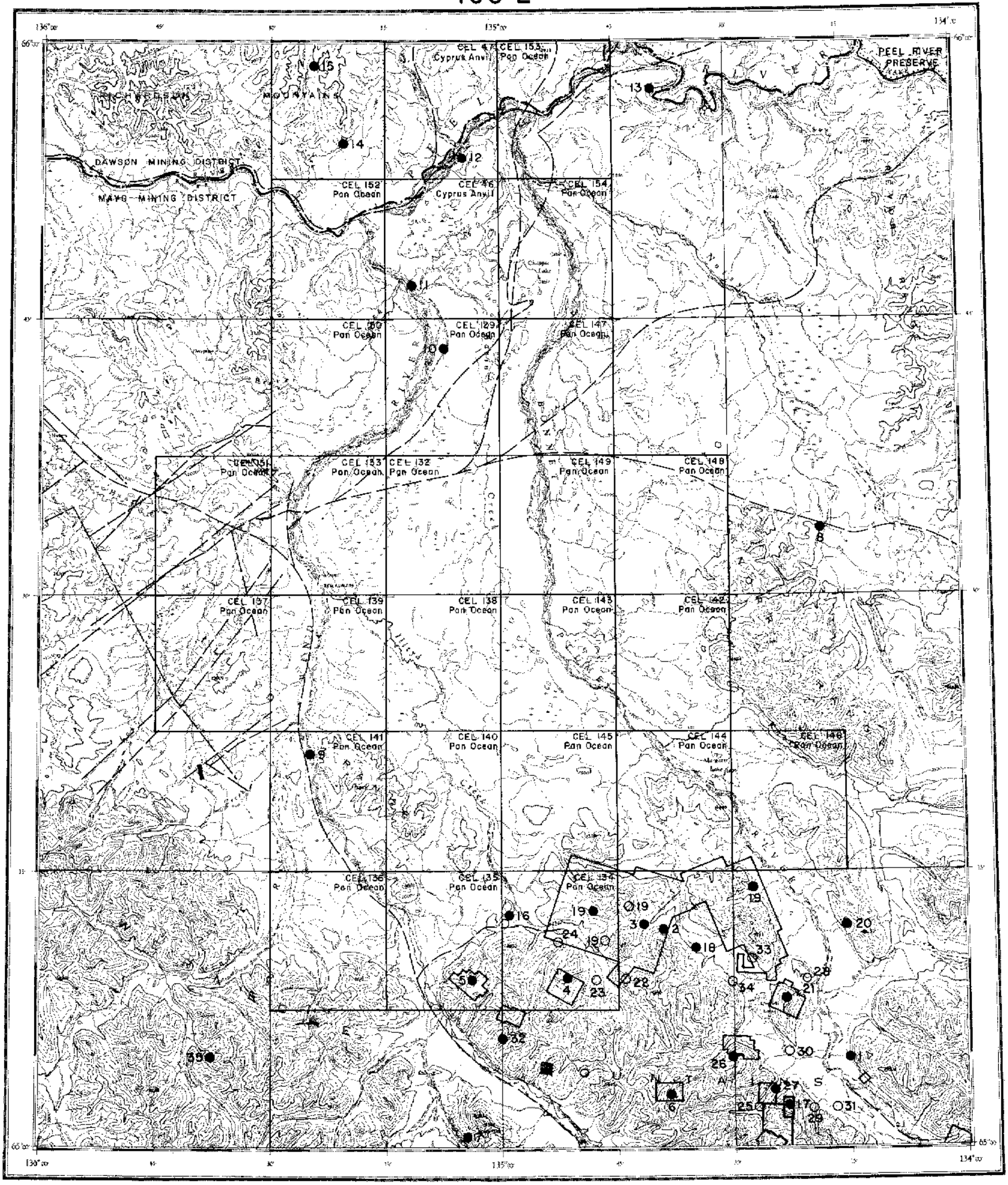
FOUND — 106 D 16 (44)
Zelon Enterprises — (64°51'N,134°06'W)

Claims 1981: JUDY (2)

CORD — 106 D 16 (56)
Riocanex Incorporated — (64°51'N,134°00'W)

Claims 1981: OVERBURDEN (4)

106 E



WIND RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.... Mineral Claims staked in 1981

.... Prospecting Leases in good standing (April 1982)

.... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

WIND RIVER MAP-AREA (NTS 106 E)

General Reference: GSC Open File 279 by: D.K. Norris, 1975.
GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	IRENE	Blusson (1976, p. 132)
2	GREMLIN	Copper-Silver Occurrence
3	CHLOE	Lead-Zinc Occurrence
4	FLUNK	Sinclair et al (1976, p. 65-67)
5	FORSTER	Sinclair et al (1975, p. 67-68)
6	IGOR	This Report
7	MAGIC	Sinclair et al (1975, p. 69)
8	HENDRY	Sinclair et al (1975, p. 63-64)
9	PRONGS	Camsell (1907, p. 30)
10	CHAPPIE	Camsell (1907, p. 27-30)
11	BASIN	Camsell (1907, p. 27-30)
12	SAINVILLE	Camsell (1907, p. 41-46)
13	LOPSTICK	Camsell (1907, p. 41-46)
14	ONCE	Sinclair et al (1975, p. 86-87)
15	TUKU	Sinclair et al (1975, p. 87)
16	SLATER	Coal
17	OTIS	D.I.A.N.D. (1981, p. 246-247)
18	SCYLLA	D.I.A.N.D. (1981, p. 247)
19	DEER	Uranium Breccia
20	BEV	Sinclair et al (1976, p. 63)
21	WERNECKE	Morin et al (1980, p. 17)
22	YOGI	Morin et al (1980, p. 21)
23	JEANETTE	Sinclair et al (1976, p. 70)
24	WINDY	Sinclair et al (1976, p. 71)
25	CUS	
26	MARTET	Morin et al (1977, p. 127)
27	THORIUM	Morin et al (1977, p. 128)
28	MTR	Morin et al (1979, p. 48)
29	ORION	Morin et al (1979, p. 45-46)
30	GSTD	Morin et al (1979, p. 46)
31	POLARIS	Morin et al (1979, p. 47)
32	TAR	Morin et al (1980, p. 20)
33	RIN	Morin et al (1980, p. 18)
34	RAPI	Morin et al (1979, p. 49)
35	LWR	Morin et al (1980, p. 21)

IGOR
Wernecke Joint Venture

Copper, Uranium in Breccia
106 E 2 (6)
(65°03'N,134°38'W)

References: Bell and Delaney (1977, p. 53); Sinclair et al (1975, p. 68).

Claims: IGOR 1-26

Source: Summary by D. Tempelman-Kluit from assessment report 090756 by W.D. Eaton and A.R. Archer.

Current Work and Results:

Mineralization is restricted to a heterolithic breccia which underlies central parts of the claims. The minerals include hematite, magnetite, barite, pyrite, chalcopyrite and pitchblende which occur with dolomite, anhydrite and siderite which are generally disseminated in the breccia matrix.

In 1979, two new radioactive zones were discovered by prospecting on the property and five drill holes totalling 486 m were completed. In 1980, 1,969 m of drilling were done in 17 holes. This drilling shows that surface faults which are unmineralized are traceable into the subsurface, but that small fractures that are mineralized can not be similarly followed downward. The best uranium, copper and cobalt concentrations occur in magnetite-rich breccia along an irregular fault that strikes east-northeast and that dips steeply west.

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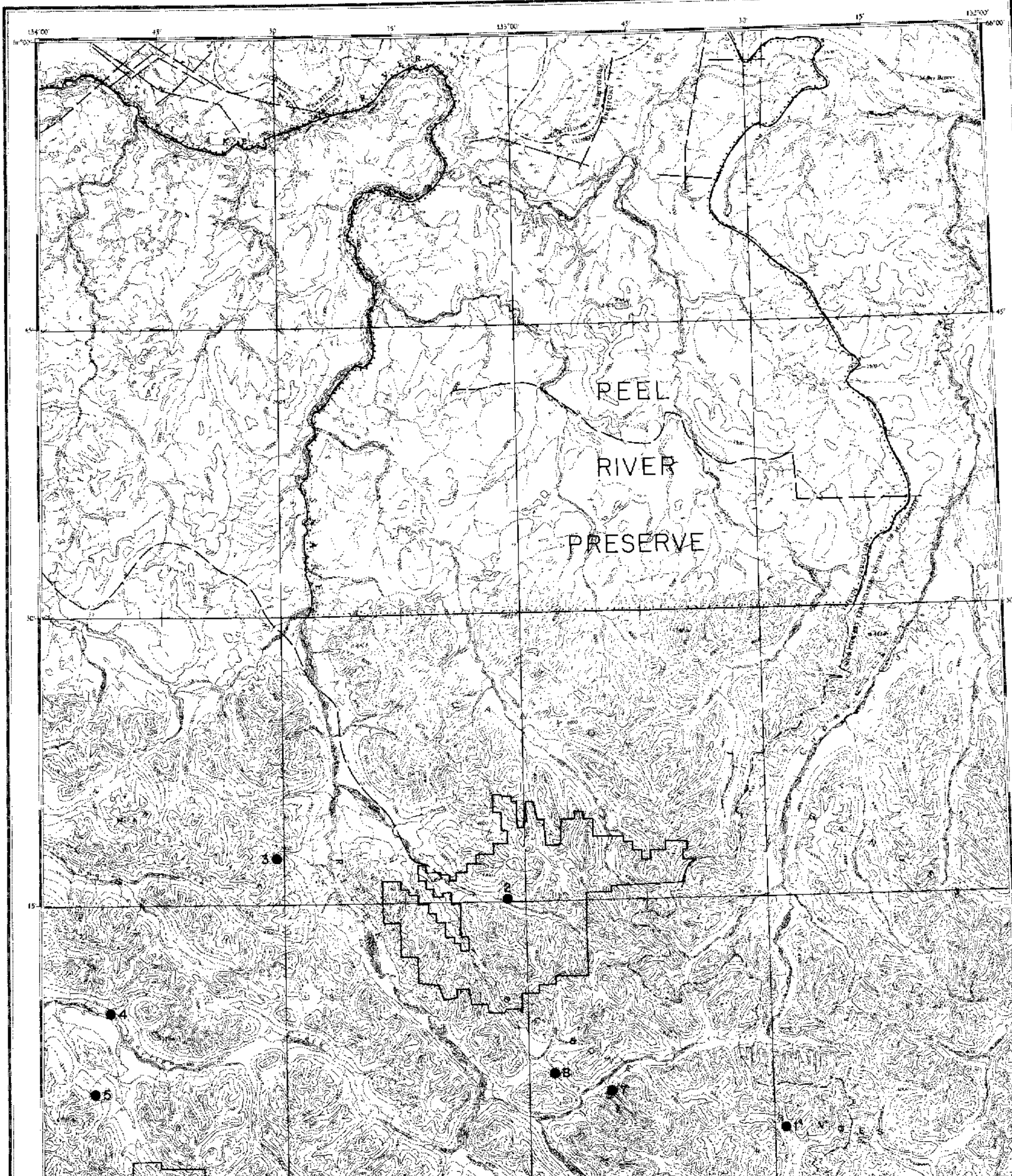
106 F



SNAKE RIVER

YUKON TERRITORY-NORTHWEST TERRITORIES

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

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...... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

SNAKE RIVER MAP-AREA (NTS 106 F)

General Reference: GSC Open File 279 by: D.K. Norris, 1975
GSC Open File 715 by: D.K. Norris, 1980

NO.	PROPERTY NAME	REFERENCE
1	VYE	Zinc Stratabound
2	CREST	Green & Godwin (1973, p. 15-18)
3	HOME	Zinc Occurrence
4	PLAINS	Zinc Stratabound
5	YUK	Lead-Zinc Occurrence
6	VOLE	This Report
7	LAURA	Morin et al (1977, p. 134)
8	BUH	Morin et al (1977, p. 134)

VOLE
Mountaineer Mines Limited;
Aberford Resources Ltd.

Cobalt, Copper, Silver Vein
106 F 4 (6)
(65°00'N,133°43'W)

Reference: D.I.A.N.D. (1981, p. 249).

Claims: VOLE 1-43

Source: Summary by K. Grapes from assessment report 090817 by D.L. Dick and D.B. Harmeson.

History:

The VOLE 1-43 mineral claims were staked in June and July, 1980 to cover favourable geologic targets.

Description:

The claims are underlain by tightly folded rocks of Proterozoic age in the upper portion of the Fairchild Group. They consist of thin-to-medium bedded impure metacarbonates intruded by a medium- to coarse-grained metadiorite.

The main zone is strongly fractured, sheared, intensely weathered and leached.

Current Work and Results:

During the 1980 field season, a preliminary investigation of the region was conducted utilizing ground prospecting, rock geochemical and geophysical surveys, geological mapping and diamond drilling.

Prospecting located anomalous copper-cobalt mineralization along fractures subparallel to an intrusion and talus flour and grab samples were taken over the main showing.

Ground magnetometer and scintillometer readings were taken on a traverse-style survey along the trend of the main breccia zone. The breccia body was found to be magnetically zoned and radioactively high.

Four diamond drill holes totalling 399.56 m were drilled.

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115 A

DEZADEASH
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

..... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

..... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

DEZADEASH MAP-AREA (NTS 115 A)

General Reference: GSC Map 1019A and Memoir 268 by: E.D. Kindle, 1952.
GSC Open File 381 by: P.B. Read and J.W.H. Monger, 1976.

NO.	PROPERTY NAME	REFERENCE
1	JACKPOT	Findlay (1969b, p. 43-44); Sinclair & Gilbert (1975, p. 72)
2	DALTON	
3	KANE	D.I.A.N.D. (1981, p. 251)
4	CHICKALOON	
5	PHOTO	Findlay (1969a, p. 74)
6	MUSH	Skinner (1961, p 37-38)
7	BATES	Kindle (1952, p. 56)
8	FENTON	Copper Vein
9	CAVE	Copper-Silver Vein
10	SHAFT	Copper Occurrence
11	BELOUD	Kindle (1952, p. 49-50, 55)
12	HUSKY	Copper
13	WREN	Copper
14	KEL	Copper
15	SHORTY	Kindle (1952, p. 49, 55)
16	KLUKSHU	Copper Occurrence
17	DEVILHOLE	Copper-Molybdenum-Lead Porphyry
18	KUSAWA	Skarn Copper
19	MILLHOUSE	
20	JOHOBO	Findlay (1967, p. 55); Kirkham (1971, p. 85)
21	REX	Findlay (1967, p. 55); Sinclair & Gilbert (1975, p. 73)
22	ELGIN	Skarn Copper
23	STRIDE	Kindle (1952, p. 56)
24	SUGDEN	Kindle (1952, p. 58)
25	FERGUSON	Bostock (1937, p. 11); Bostock (1936, p. 12)
26	DECOELI	Copper-Asbestos Vein
27	KLOO	Findlay (1967, p. 54)
28	SOUTHER	Souther & Stanciu (1975, p. 66-70)
29	SIFTON	D.I.A.N.D. (1981, p. 251)
30	CHARLIE	This Report

1981 MINERAL CLAIMS STAKED

CHARLIE 115 A 3 (30)
C. Ross (60°00'N,137°07'W)

Claims 1981: CHARLIE; CHUCK; JIM; JEAN; ROBIN

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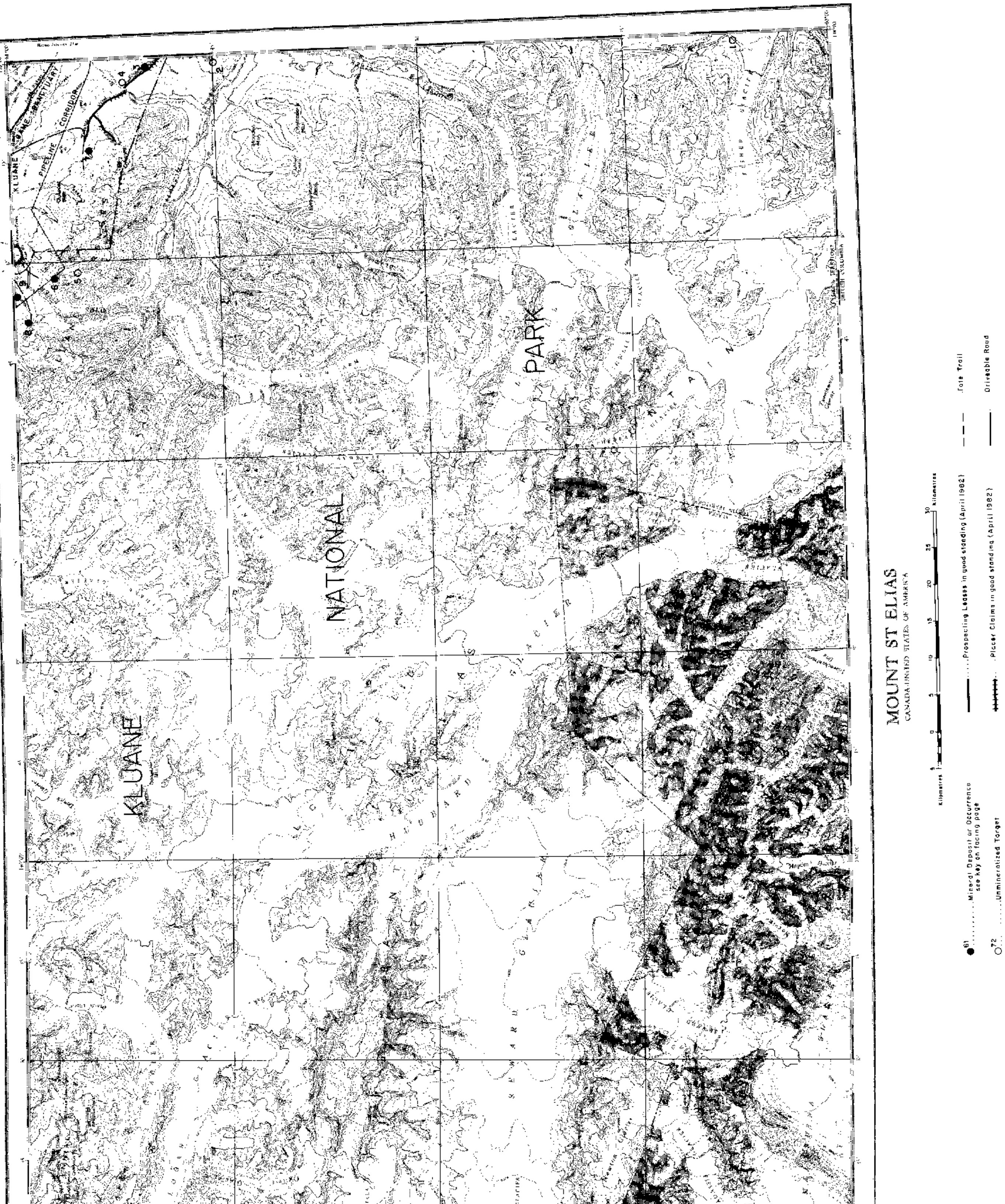
KLUANE NATIONAL PARK
MOUNT ST ELIAS
CANADA-UNITED STATES OF AMERICA
Kilometres 5 0 5 10 15 20 25 30 Kilometres
61 ....Mineral Deposit or Occurrence see key on facing page
72 ....Unmineralized Target
........Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
........Mineral Claims staked in 1981
........Prospecting Leases in good standing (April 1982)
........Placer Claims in good standing (April 1982)
CEL........Coal Exploration Licence
CML........Coal Mining Lease
........Tote Trail
........Driveable Road
........Oil or Gas Well
........Airstrip

MOUNT ST. ELIAS MAP-AREA (NTS 115 B-C)

General Reference: GSC Map 1143A by: J.O. Wheeler, 1963.
GSC Open File 381 by: P.B. Read and J.W.H. Monger, 1976.

NO.	PROPERTY NAME	REFERENCE
1	PLUG	Copper-Silver Occurrence
2	KASKAWULSH	Copper-Silver Occurrence
3	KIMBERLEY	Kindle (1952, p. 58)
4	JARVIS	McConnell (1905, p. 1-18)
5	DULUTH	Nickel-Copper Magmatic
6	GIBBONS	Nickel-Copper Magmatic
7	TELLURIDE	Copper-Zinc-Silver-Gold-Nickel Massive
8	BULLION	Gypsum-Copper-Lead Stratabound
9	SHEEP	McConnell (1905, p. 1-18)

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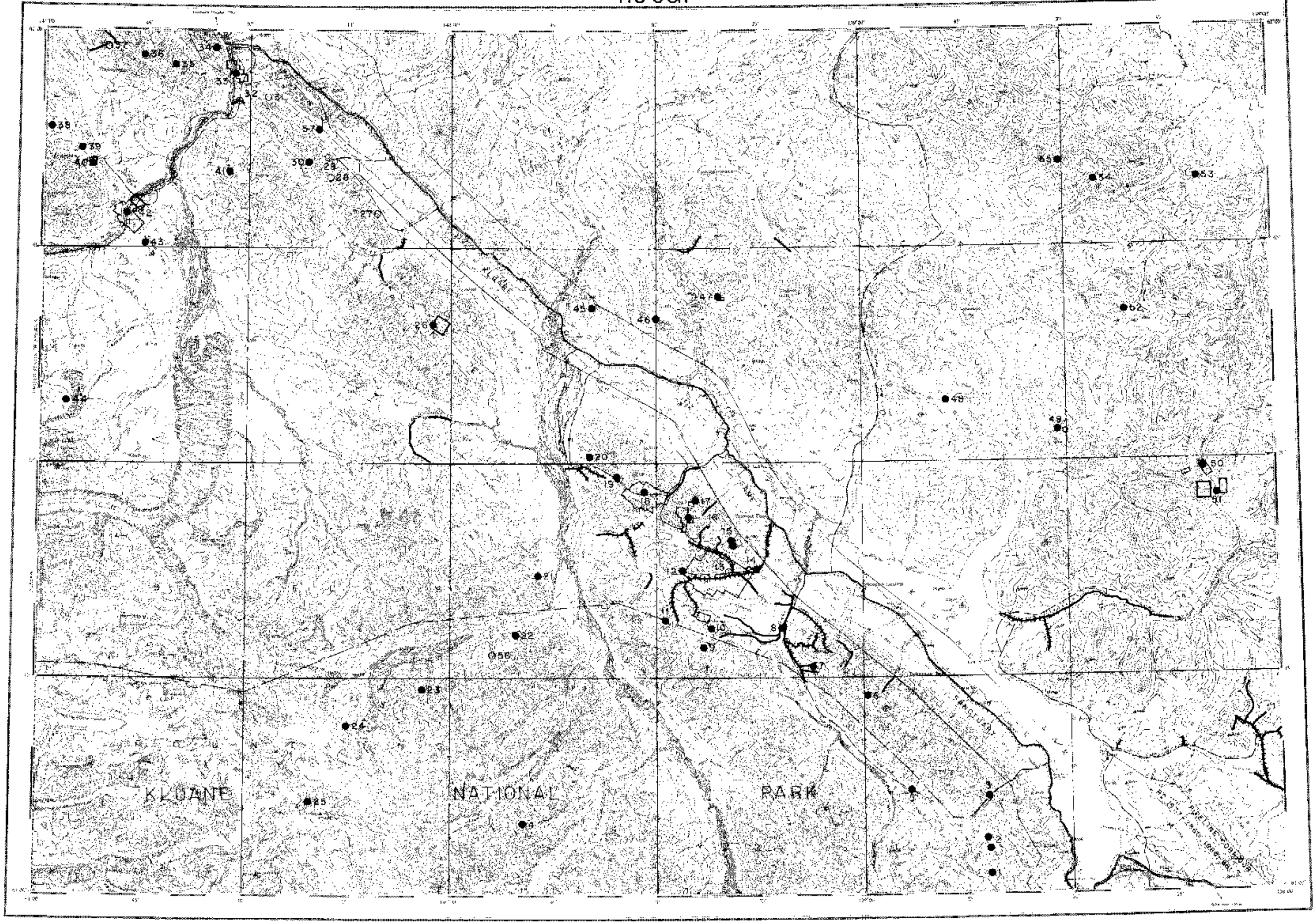
115 G&F



KLUANE LAKE

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

● 61 ....Mineral Deposit or Occurrence see key on facing page

○ 72 ....Unmineralized Target

....Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

....Mineral Claims staked in 1981

....Prospecting Leases in good standing (April 1982)

....Placer Claims in good standing (April 1982)

CEL....Coal Exploration Licence

CML....Coal Mining Lease

....Tote Trail

....Driveable Road

....Oil or Gas Well

....Airstrip

KLUANE MAP-AREA (NTS 115 F/G)

General Reference: GSC Map 1177A and Memoir 340 by: J.E. Muller, 1967. GSC Open File 381 by: P.B. Read and J.W.H. Monger, 1976.

NO.	PROPERTY NAME	REFERENCE
1	METALLINE	McConnell (1905, p. 18)
2	STOVE	Muller (1967, p. 113-114)
3	CONGDON	Sinclair & Gilbert (1975, p. 66-67)
4	MULLER	Muller (1967, p. 112)
5	DICKSON	Nickel-Copper-Cobalt Magmatic
6	DESTRUCTION	Nickel-Copper Magmatic
7	WINDGAP	Craig & Laporte (1972, p. 153-154)
8	DUKE	Asbestos
9	HOGE	Muller (1967, p. 113-115)
10	AMPHITHEATER	Muller (1967, p. 113-115)
11	WADE	Copper-Silver
12	CORK	D.I.A.N.D. (1981, p. 256)
13	GLEN	This Report
14	BURWASH	Cairnes (1915, p. 31)
15	JACQUOT	Craig & Laporte (1972, p. 103); Kirkham (1971, p. 85)
16	QUILL	Findlay (1969a, p. 70-72); Kirkham (1971, p. 85)
17	VERSLUCE	Findlay (1969a, p. 70-72)
18	WELLGREEN	Sinclair & Gilbert (1975, p. 64-65); Eckstrand (1972, p. 81-82)
19	AIRWAYS	Copper-Nickel Magmatic
20	MUSKETEER	Copper-Nickel Magmatic
21	CEMENT	McConnell (1906, p. 19-26); McConnell (1905, p. 18)
22	ST. ELIAS	Skinner (1961, p. 36)
23	SHARPE	Muller (1967, p. 112)
24	GALLOPING	Skinner (1961 p. 36)
25	ICEFIELD	Skinner (1961, p. 36)
26	GARLIC	Copper-Molybdenum Occurrence; This Report
27	LIBERTY	Copper-Nickel Occurrence
28	DUENSING	
29	CATS AND DOGS	Copper-Nickel Occurrence
30	MEXICO	Skarn Copper
31	PICKHANDLE	Kirkham (1971, p. 85)
32	SEVENSMA	
33	CANALASK	Findlay (1969b, p. 39); Sinclair & Gilbert (1975, p. 60-61); Eckstrand (1972, p. 81-82)
34	EPIC	Copper-Molybdenum Vein
35	TAYLOR	Skarn Copper-Molybdenum
36	SANPETE	Craig & Milner (1975, p. 37-38)
37	HUMP	Johnston (1915, p. 193)
38	MEMOIR	Cairnes (1915 p. 141)
39	MCLELLAN	Cairnes (1915 p. 141)
40	RABBIT	Cairnes (1915, p. 123-124)
41	LEP	Craig & Milner (1975, p. 38-39)
42	WHITERIVER	Sinclair et al (1975, p. 138-139); This Report
43	SHARE	
44	KLETSAN	Findlay (1969b, p. 42); Moffit & Knopf (1910, p. 51-57)
45	ELEVENTHIRTY	Bostock (1952, p. 40)
46	KENNEDY	Bostock (1952, p. 40)
47	TINCUP	D.I.A.N.D. (1981, p. 256)
48	BROOKS	Muller (1967, p. 112-113)
49	TALBOT	D.I.A.N.D. (1981, p. 256)
50	RAFT	D.I.A.N.D. (1981, p. 256)
51	ROCKSLIDE	Muller (1967, p. 112-113); This Report
52	DWARF	Sinclair & Gilbert (1975, p. 70-71)
53	BIRCH	Craig & Milner (1975, p. 83)
54	BRUMMER	Craig & Milner (1975, p. 85-86)
55	RHYOLITE	Craig & Milner (1975, p. 83, 87)
56	NICK	Nickel Magmatic
57	KOIDERN	Morin et al (1977, p. 130)

GLEN
Halferdahl and Associates Ltd. — Geochemical Target, 115 G 6 (13), (61°22'N, 139°23'W)

References: Morin et al (1980, p. 46); Read and Monger (1976, p. 56).

Claims: KAT 9-24; JY 9-56; JO 4,6; WEN 5

Source: Summary by P. Watson from assessment reports 090848 and 090875 by L.B. Halferdahl, and assessment report 090891 by D.B. Nelson.

Current Work and Results:

Results of geochemical soil sampling and some geological work carried out in 1980 were reported. Three lines were sampled at 40 m intervals for a total of 179 samples. Thresholds of 24 ppm As, 110 ppm Cu, 12 ppb Au, 13 ppm Pb, 185 ppm Ni and 140 ppm Zn were estimated from this and earlier work. Anomalous Au samples were not coincident with anomalous Zn, Pb or As samples.

The 1981 program on the KAT and JY claims consisted of geological mapping on some of the claims staked in 1980, and a heavy mineral survey. Five creeks were sampled for a total of 25 samples. A five-gallon pail of sample was field panned to approximately 0.5 kg, prior to laboratory processing and analysis for Cu, Ni, Pb, Zn and Au. Au, Cu and Pb values were considered anomalous in several of the creeks but were too few for a rigorous statistical evaluation.

The 1981 program on the JO and WEN claims included the excavation of two sumps and approximately 200 m in two trenches, and the drilling of 297 m in 5 BQ diamond drill holes. The contact between the Station Creek and Hasen Creek Members of the Permian Skolai Group has been tentatively placed at or near a gabbroic sill 200 m to 300 m or more thick, which has been identified on some of the JO and KAT claims. Four of the drill holes did not reach the base of the thick gabbroic sill and showed very low concentrations of copper, nickel, platinum and palladium. The fifth hole missed the sill, and intersected the underlying tuffaceous rocks.

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1981 MINERAL CLAIMS STAKED

GARLIC — 115 F 9 (26) (61°39'N,140°02'W)
Archer, Cathro and Associates Limited

Claims 1981: NARNIA (16)

WHITERIVER — 115 F 15 (42) (61°48'N,140°46'W)
R. Ellwood et al

Claims 1981: AG (8)

GLEN — 115 G 6 (13) (61°22'N,139°19'W)
L.B. Halferdahl and Associates Limited

Claims 1981: EL (2)

ROCKSLIDE — 115 G 8 (51) (61°27'N,138°10'W)
S. Denton

Claims 1981: JUBA (16)

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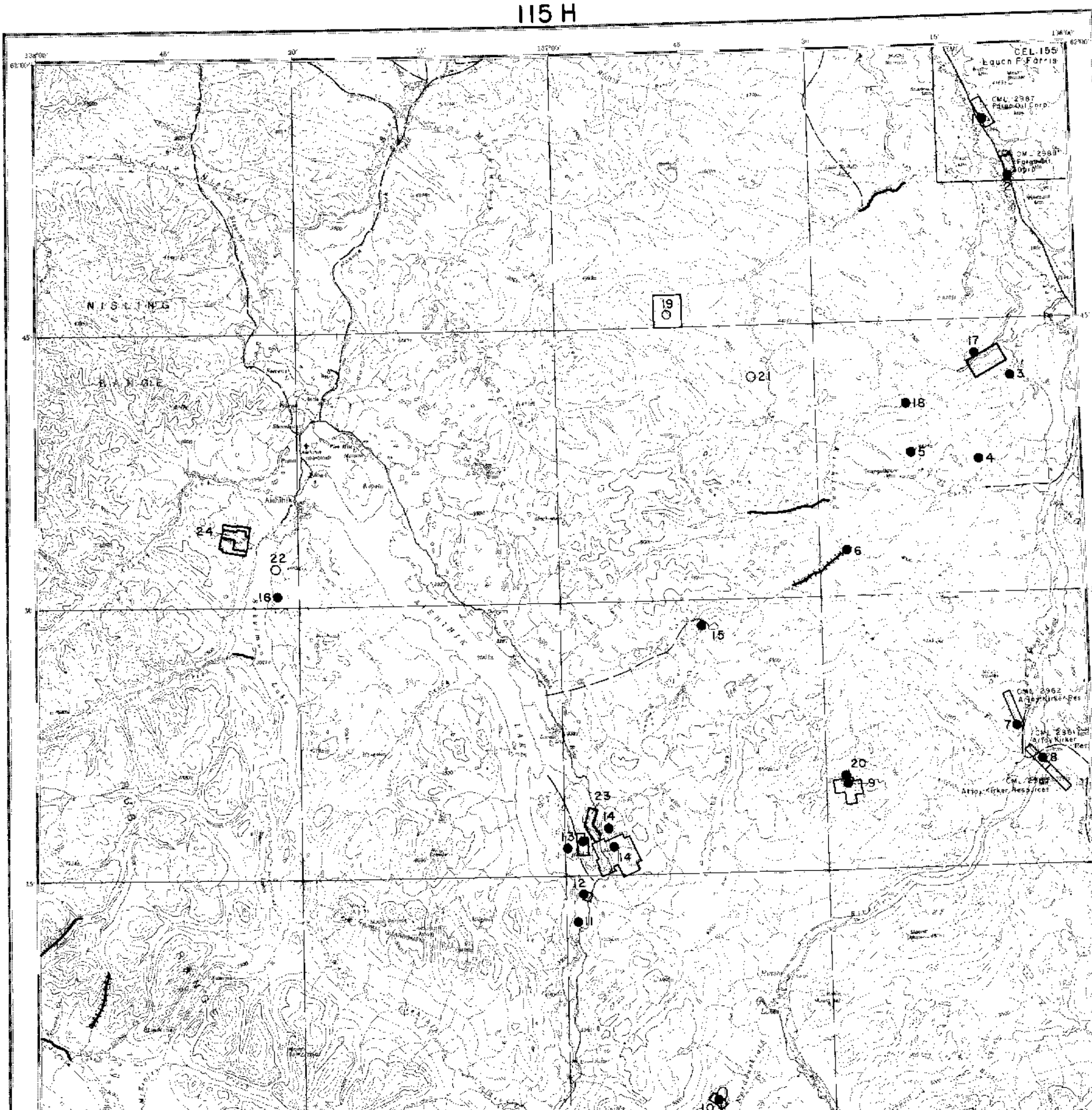
115 H



AISHIHIK LAKE
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page

○72 .... Unmineralized Target

...... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

..... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

AISHIHIK LAKE MAP-AREA (NTS 115 H)

General Reference: GSC Map 17-1973 and Paper 73-41 by: D.J. Tempelman-Kluit, 1974.

NO.	PROPERTY NAME	REFERENCE
1	LOSCH	Cairnes (1910, p. 49)
2	ANDESITE	Coal
3	AH	Copper Vein
4	MACK'S	Craig & Milner (1975, p. 80-81)
5	SNIPE	Copper Occurrence
6	KIRK	Copper Occurrence
7	VOWEL	Cairnes (1908, p. 10-15)
8	DIVISION	Coal
9	LION	Molybdenum-Lead Occurrence
10	MORAINE	D.I.A.N.D. (1981, p. 258); This Report
11	GILTANA	D.I.A.N.D. (1981, p. 258)
12	AISHIHIK	Sinclair & Gilbert (1975, p. 69-70); D.I.A.N.D. (1981, p. 258)
13	JANISIW	Cairnes (1910, p. 57-58); D.I.A.N.D. (1981, p. 258);This Report
14	HOPKINS	Morin et al (1980, p. 46)
15	SATO	Craig & Milner (1975, p. 88-89)
16	SEKULMUN	
17	ORLOFF	Gold Occurrence;This Report
18	SHAD	Copper
19	BUFFALO	D.I.A.N.D. (1981, p. 25[illegible])
20	BUN	Morin et al (1977, p. 167)
21	TOSH	Morin et al (1980, p. 46)
22	SEK	Morin et al (1980, p. 46)
23	SIDE	This Report
24	HATCH	This Report

JANISIW
Bolero Mines Limited, N.P.L.
Copper
115 H 7 (13)
(61°17'N,136°58'W)

Reference: Cairnes (1910, p. 57-58); Morin (1981 in D.I.A.N.D. 1981, p. 98-104).

Claims: COP 1-14

Source: Summary by P. Watson from assessment report 090884 by A.S. Ashton.

History:

These claims were staked in 1980 and may cover an occurrence reported in 1910. They are located on the west side of Hopkins Lake, approximately 0.8 km west of the Aishihik Road.

Current Work and Results:

At least two zones of marble are located at different horizons within the quartz biotite schists. The mineralized zones are generally near the contacts with granitic rocks and dykes. Mineralization in the upper skarn is of limited extent. In the lower marble, which is up to 3.6 m wide, widely spaced fractures up to 0.6 m in width carry copper mineralization. One 0.76 m sample across a quartz stringer zone assayed 18.14% Cu, 117.6 g Ag/t and 1.17 g Au/t.

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HATCH
Canadian Occidental Petroleum Limited
Molybdenum, Copper, Tungsten
115 H 12 (24)
(61°34'N, 137°37'W)

Claims: PATCH, THATCH, HATCH (37)

Current Work and Results:

During 1981, approximately 20 of the claims were mapped at a scale of 1:2,400, and soil geochemistry was carried out. EM-16 and magnetometer surveys were undertaken on 21 of the claims.

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1981 MINERAL CLAIMS STAKED

MORAINE
Hudson Bay Exploration
115 H 2 (10)
(61°02'N,136°44'W)

Claims 1981: COOT (8) restaked

SIDE
T. Yardley et al
115 H 7 (23)
(61°18'N,136°57'W)

Claims 1981: SIDE (16)

ORLOFF
H. Damron et al
115 H 9 (17)
(61°43'N,136°10'W)

Claims 1981: KIRK (32)

HATCH
Canadian Occidental Petroleum Company Limited
115 H 12 (24)
(61°34'N,137°37'W)

Claims 1981: PATCH (16)

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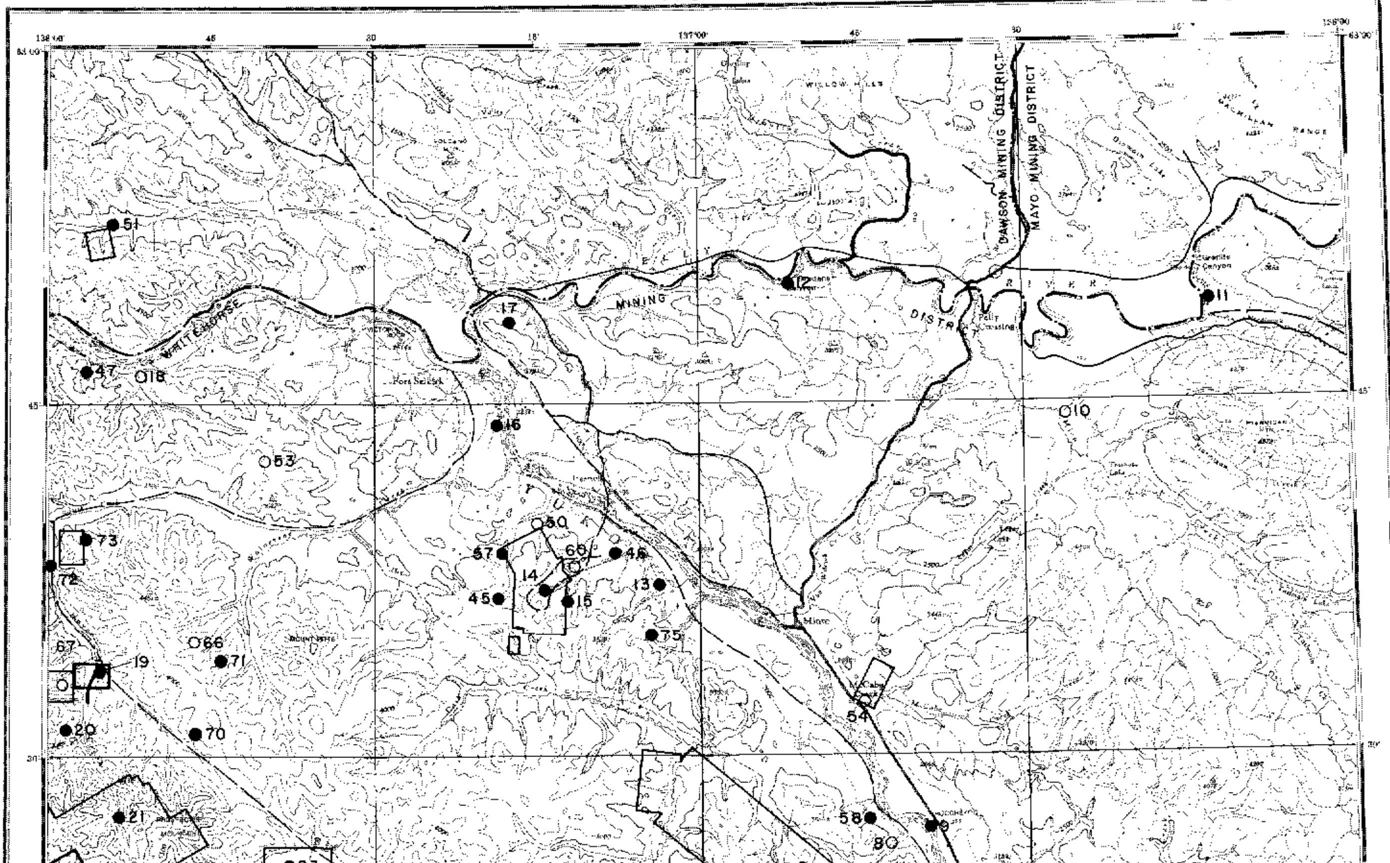
115 I



CARMACKS
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page

○72 ....Unmineralized Target

.......Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

.......Mineral Claims staked in 1981

.....Prospecting Leases in good standing (April 1982)

.....Placer Claims in good standing (April 1982)

CEL.........Coal Exploration Licence

CML.........Coal Mining Lease

.......Tote Trail

.......Driveable Road

.........Oil or Gas Well

.........Airstrip

CARMACKS MAP-AREA (NTS 115 I)

General Reference: GSC Open File 200 by: D.J. Tempelman-Kluit, 1972.

NO.	PROPERTY NAME	REFERENCE
1	SOUTH TANTALUS	Findlay (1967, p. 89)
2	TANTALUS MINE	Cairnes (1910, p. 59-63); Bostock (1936, p. 58-59)
3	TANTALUS BUTTE	Cairnes (1910, p. 52-53); Findlay (1969a, p. 114); Sinclair et al (1975, p. 168)
4	FIVE FINGERS MINE	Bostock (1936, p. 62-63)
5	WILLIAMS CREEK	Copper-Silver-Gold-Molybdenum Occurrence
6	MERRICE	Brock (1910, p. 14-26)
7	BONANZA KING	Green (1966, p. 42-44)
8	MAUD	
9	HOOCHEKOO	Dawson (1889, p. 145 B)
10	TOWHATA	Bostock (1936, p. 63)
11	NEEDLEROCK	McConnell (1903, p. 31, 38)
12	BRADENS CANYON	Copper-Gold-Silver-Molybdenum Occurrence
13	COIN	Sinclair & Gilbert (1975, p. 48-49)
14	MINTO	Sinclair et al (1975, p. 96-100)
15	PAL	Sinclair et al (1975, p. 100-101)
16	GRENIER	Bostock (1936, p. 63)
17	PELLY	This Report
18	MINNESOTA	
19	TAD	Craig & Milner (1975, p. 77-79)
20	PHELPS	Craig & Laporte (1972, p. 71-72)
21	FROG	This Report
22	STARBIRD	Craig & Milner (1975, p. 70-71)
23	CASH	Sinclair et al (1975, p. 111-112)
24	KLAZAN	This Report
25	COM	
26	REVENUE	This Report
27	COMBO	Craig & Laporte (1972, p. 83-84)
28	BOW	Craig & Laporte (1972, p. 82-83)
29	LIL	Bostock (1939, p. 16)
30	CARIBOU CREEK	Bostock (1939, p. 15-16); Sinclair et al (1975, p. 118-119)
31	KOOK	Sinclair et al (1975, p. 117-118)
32	RED FOX	D.I.A.N.D. (1981, p. 261)
33	GUDER	D.I.A.N.D. (1981, p. 261)
34	LAFORMA	D.I.A.N.D. (1981, p. 261)
35	EMMON	Johnston (1937, p. 19-20); Craig & Laporte (1972, p. 78-79)
36	GRANITE MOUNTAIN	Findlay (1969a, p. 34-35)
37	TINTA HILL	Sinclair et al (1975, p. 120-121); Skinner (1961, p. 35-36); This Report
38	FOSTER	Bostock (1937, p. 10-11)
39	BROWN McDADE	Findlay (1969b, p. 23)
40	MT. NANSEN	Findlay (1969a, p. 35-38); Craig & Laporte (1972, p. 88-89)
41	CYPRUS	D.I.A.N.D. (1981, p. 261)
42	ESANSEE	This Report
43	DIVIDE	Sinclair et al (1975, p. 126)
44	MALONEY	Craig & Laporte (1972, p. 76-78)
45	COMANCHE	Sinclair et al (1975, p. 101-102)
46	NORTHAIR	Sinclair et al (1975, p. 107)
47	TUF	Sinclair et al (1975, p. 95)
48	CROSSING	Copper Vein
49	EWING	
50	ORI	Sinclair et al (1975, p. 108-109)
51	KERR	Molybdenum-Copper Occurrence
52	LONELY	Copper Occurrence
53	SAM	
54	McCABE	
55	RINK	McConnell (1903, p. 37-52)
56	GOULTER	Gold-Silver Vein
57	GIANT	Sinclair et al (1975, p. 102-103)
58	BLUFF	Sinclair et al (1975, p. 122-123)
59	RUSK	Sinclair & Gilbert (1975, p. 38-39)
60	BOYLEN	Sinclair et al (1975, p. 103)
61	HLAVAY	Sinclair & Gilbert (1975, p. 120-121)
62	LETA	D.I.A.N.D. (1981, p. 262)
63	DART	D.I.A.N.D. (1981, p. 262)
64	NUCLEUS	This Report
65	STU	This Report
66	MUT	D.I.A.N.D. (1981, p. 263)
67	NIT	This Report
68	ROC	Morin et al (1977, p. 172)
69	ZIT	This Report
70	PANTHER	Sinclair et al (1976, p. 142)
71	PITTS	Sinclair et al (1976, p. 143)
72	NADA	Sinclair et al (1976, p. 144)
73	SELKIRK	Sinclair et al (1976, p. 145)
74	ACE	This Report
75	FED	Morin et al (1977, p. 177)
76	DD	This Report

PELLY
United Keno Hill
Mines Limited;
Falconbridge Limited

Copper, Molybdenum
115 I 4 (17)
(62°49'N,137°16'W)

Reference: Craig & Milner (1975, p. 60).

Claims: DAD (68)

Current Work and Results:

During 1981, the claim group was mapped and prospected at a scale of 1:5,000. Fourteen of the claims were soil sampled on a 30 m by 100 m grid and samples analyzed for Cu and Mo. Several large quartz and felsite veins and dykes contained very minor traces of chalcopyrite and molybdenite.

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FROG
Archer, Cathro and
Associates Limited

Silver, Lead Veins
115 I 5, J 8 (21)
(62°27'N,137°55'W)

References: D.I.A.N.D. (1981, p. 261); Craig and Milner (1975, p. 58).

Claims: LILYPAD 1-429; NEWT 1-20

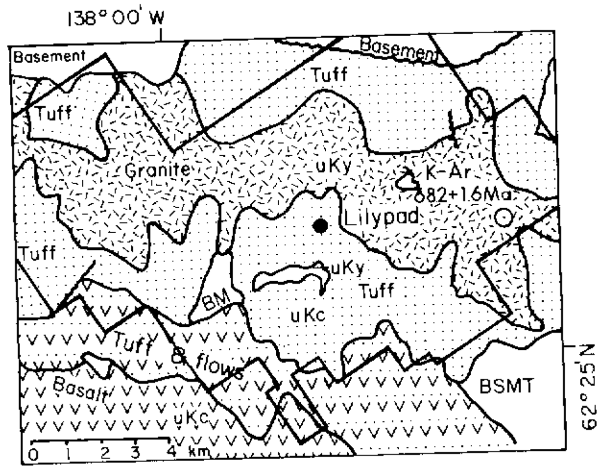
Source: Summary by D. Tempelman-Kluit based on property visit and by P. Watson from assessment report 090975 by A.R. Archer.

Geology and Mineralization:

The LILYPAD - NEWT claims cover parts of Prospector and Apex Mountains. Higher areas are underlain by granite to syenite, which has intruded tuffs and breccias of intermediate composition with intercalated basalt flows. The granite and volcanics are Late Cretaceous and are considered cogenetic. Contacts between granite and volcanics conform with layering in the volcanics; the volcanics are baked and propylitized within 100 m of the granitic rocks. The breccias and tuffs differ from the Carmacks Group, but because they are intercalated with basalt flows like those of the Carmacks Group, and because they grade upward into the Carmacks Group, they are considered a lithologically distinctive lower part of that unit.

Granite is medium-grained, equigranular, pale mauve coloured with euhedral thick tabular mauve feldspars that lend the rock a crowded porphyry texture. Hornblende is present as fresh, stubby prisms with fresh biotite flakes as inclusions. Quartz, in grey, glassy, subhedral grains, makes up nearly 10 percent by volume, locally falling below that proportion so that the rock grades to syenite.

The breccias and tuffs occur in regularly-bedded sheets up to 10 m thick. They are commonly planar bedded, clasts are angular to subrounded and exclusively of greenish to red altered volcanic fragments commonly less than 3 cm across. Tuffs are intercalated with tuff breccias and locally show cross bedding. The tuffs were deposited in fresh water and transported some distance from their volcanic source, their grains being abraded during transport. About 200 m of tuffs are seen on the claims. Upward they are intercalated with brown basalt



flows, each several metres thick.

Because of its conformable contact relations with the volcanics, its composition and its texture, the granite may be a laccolith with a gently-domed, lens-shaped top and a flat base.

Hornblende from the granites on Prospector Mountain was isotopically (K-Ar) dated as 68.2 ± 1.6 Ma. The date is interpreted as the time of cooling following intrusion, and because the rocks are fresh and the intrusion is relatively small the date is probably close to the intrusive age.

Current Work and Results:

The 1981 program included surveying, trenching, channel sampling and geological mapping. New claims were added in 1981 for a total of 590 claims.

Surveying included the establishment of a control grid and aerial photography at 1:12,000 and 1:24,000 scale.

During the program, 1,600 soil, 106 stream sediment and 347 rock surface samples were collected.

One hundred and thirty three (133) bulldozer trenches, averaging 30 m long were completed and 702 channel samples were collected from these trenches.

The 1981 mapping program showed that veins occur in volcanics and syenites in a 11 km by 6 km area. The veins occur as two sets, one striking north and the other northeast, that cut the volcanic and subvolcanic rocks. They are recessive-weathering zones that can be traced on airphotos.

Vein material is mostly oxidized and includes cockade and ribbon quartz with goethite, jarosite, scorodite, malachite and anglesite. Galena is present locally and one assay of 69.3% Pb was reported. Other primary sulphides seen locally include pyrite, arsenopyrite and chalcopyrite.

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KLAZAN
Archer, Cathro and Associates Limited; Nat Joint Venture

Geochemical Target
115 I 5, 6 (24)
(62°23'N,137°30'W)

Reference: Craig and Laporte (1972, p. 87-88).

Claims: NITRO 1-24

Source: Summary by P. Watson from assessment report 090974 by A.R. Archer.

History:

The NITRO claims were staked in 1981 by Nat Joint Venture (Chevron Canada Limited and Armco Mineral Exploration Limited) to cover geochemical anomalies. The area was first staked in 1966 as the KLAZAN claims and geochemical and magnetic surveys, trenching and 967 m of diamond drilling were completed.

Description:

The property is underlain by Jurassic granite and quartz monzonite, and Late Cretaceous to Early Tertiary quartz porphyry, rhyolite porphyry and feldspar porphyry, which have intruded an elongate batholith of porphyritic hornblende syenite and rhyolitic volcanic rocks.

Current Work and Results:

In 1981, geochemical and geological studies were conducted, and the old drill core was resampled.

******

REVENUE
Yukon Revenue Mines Limited

Copper, Gold
115 I 6 (26)
(62°20'N,137°16'W)

References: Morin et al (1980, p. 47); Sinclair et al (1975, p. 114-115); Craig and Laporte (1972, p. 79-82); Findlay (1969a, p. 38-39, 1969b, p. 26); Green (1966, p. 31-33); Green and Godwin (1964, p. 29).

Claims: REVENUE COPPER 2; ADDITION 4; AU 1-4, 6; INCA 1-4, 7-8; HOMESTAKE 1-2

Source: Summary by P. Watson from assessment report 090854 by R. Granger.

Current Work and Results:

The logs of three 1980 BQ diamond drill holes, completed to a total depth of 179.6 m, were reported. These holes intersected altered biotite quartz monzonite and brecciated zones, with occasional sulphides noted. Chalcopyrite, malachite and trace scheelite were indicated and results in two holes were reported as 0.41 g Au/t, 5.83 g Ag/t, 0.23% Cu and 0.04% WO_3 over 36.6 m, and 0.34 g Au/t, 9.94 g Ag/t, 0.16% Cu and 0.05% WO_3 over 39.6 m.

******

ESANSEE
BRX Mining and Petroleum Corporation

Silver, Gold, Lead, Zinc Vein
115 I 3 (42)
(62°07'N,137°15'W)

References: D.I.A.N.D. (1981, p. 261-262); Morin (1981, in D.I.A.N.D. 1981, p. 71-72); Craig and Laporte (1972, p. 90-91); Findlay (1969b, p. 25).

Claims: TAWA 1-72

Source: Summary by P. Watson from assessment report 090909 by D.J. Brownlee.

Current Work and Results:

In 1981, EM-16 and proton magnetometer surveys were conducted on eight of these claims. The EM-16 survey indicated a series of en echelon anomalies trending northwest from the original showings.

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NUCLEUS
Archer, Cathro and Associates Limited; Nat Joint Venture

Geochemical Target
115 I 6 (64)
(62°20'N,137°30'W)

References: D.I.A.N.D. (1981, p. 262); Sinclair et al (1975, p. 114-115).

Claims: NUCLEUS 1-50

Source: Summary by P. Watson from assessment report 090973 by A.R. Archer.

Current Work and Results:

The NUCLEUS 35-50 claims were staked in 1981, during which year detailed geological, grid geochemical and magnetometer surveys were conducted, and old drill core was resampled.

The rocks are highly altered. In 1981, 376 soil samples were collected and the magnetometer survey indicated a regional background trend increasing towards Big Creek and also reflected the syenite-metasedimentary rock contact.

******

STU
United Keno Hill Mines Limited; Falconbridge Limited

Copper
115 I 6, 7 (65)
(62°21' - 62°30'N, 136°42' - 137°06'W)

References: D.I.A.N.D. (1981, p. 262-263); Morin et al (1980, p. 48); Morin et al (1979, p. 71-72).

Claims: STU; MOON, NOON, FIL, HI (total of 658 claims)

Source: Summary by P. Watson from assessment report 090729 (STU) by P. Watson and J. Fisher, assessment report 090850 (FIL) by D.C. Fraser, assessment report 090929 (NOON) by L.L. Coughlan and R.J. Joy, asssessment report 090930 (MOON) by R.J. Joy and assessment report 090931 (FIL) by G. Davidson and R.J. Joy.

Current Work and Results:

This claim block includes the STU claims, the NOON claims located south of STU, the MOON claims to the west and northwest of STU, the FIL claims to the north and northwest of STU and the HI claims to the northwest of FIL.

BQ diamond drill logs were submitted for 4 holes drilled in 1980 on the STU property. These holes, totalling 959.2 m, intersected non-foliated porphyritic to strongly-foliated granodiorite to quartz monzonite, along with mafic dykes, aplites, pegmatites and biotite schlieren. Alteration zones were dominated by chlorite, clays or rust. Occasional disseminated magnetite, pyrite and chalcopyrite were reported. A section of 25.4 m in one hole average 0.15% Cu, 6.2 g Ag/t and trace Au. See previous references for details on geology and other drilling results.

During 1981, geological and geochemical surveys were conducted on the NOON, MOON, HI and FIL claims, and 3,696 line km of airborne DIGHEM II electromagnetic, resistivity and magnetometer survey were flown in the area.

On the FIL claims, 17,046 soil samples were collected and analyzed for Cu, and several significant anomalies of greater than 100 ppm Cu were indicated. Values greater than the threshold of 50 ppm Cu were considered anomalous. The most prominent anomaly correlates with a resistivity low and appears to be an extension of a belt of copper enrichment previously located on other claim blocks. There is generally a poor correlation between EM conductors and geochemical anomalies, although the geophysical survey did prove useful in delineating structural features in the area.

On the MOON claims, 2,335 soil samples were analyzed for Cu, with 19 values greater than 50 ppm. Analyses of 360 soil samples collected over volcanics for Cu and Ag yielded 13 anomalous samples. Assays for up to five elements were also done on 18 rock samples.

On the NOON claims, 3,412 soil samples were collected and analyzed for Cu. Of these, 853 were also analyzed for Ag with no anomalous results. Two significant copper anomalies were reported.

Detailed grid soil sampling was also carried out on 14 of the HI claims.

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NIT
Archer, Cathro and Associates Limited; Nat Joint Venture

Geochemical Target
115 I 12, J 9 (67)
(62°33'N,137°59'W)

Claims: NIT 1-36

Source: Summary by P. Watson from assessment report 090972 by A.R. Archer.

History:

The claims were staked in 1980 by Nat Joint Venture (Chevron Canada Limited and Armco Mineral Exploration Limited) on the basis of anomalous arsenic geochemical values in the area of a known porphyry copper showing (TAD). This showing consists of minor sphalerite, chalcopyrite, arsenopyrite, tetrahedrite and molybdenite in weak quartz veining in strongly altered pyrite quartz monzonite porphyry.

Description:

The area is underlain by Paleozoic and older metamorphic rocks of the Yukon Crystalline Terrane, which have been intruded by granite and alaskite of the Coffee Creek Batholith (Cretaceous to Tertiary) and by a subvolcanic quartz and feldspar porphyry phase of the Mount Nansen Group. Most of the claims are underlain by the Coffee Creek Batholith and a quartz-feldspar porphyry plug. Carbonaceous quartz schist and quartzite of the Yukon Group underlies the western part of the claims.

Current Work and Results:

In 1981, geological and geochemical surveys were undertaken. No visible mineralization or extensive alteration were found. A total of 123 geochemical samples were assayed for Pb, As, and Ag. As values were anomalous over the quartz feldspar porphyry. Ag and Pb anomalous values were coincident but isolated.

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ZIT
Arctic Red Resources Corporation; Archer, Cathro and Associates Limited

Copper, Gold
Porphyry
115 I 6 (69)
(62°17'N,137°11'W)

Reference: D.I.A.N.D. (1981, p. 261); Morin (1981, in D.I.A.N.D. 1981, p. 69-71).

Claims: SEYMOUR 1-44

Source: Summary by P. Watson from assessment report 090906 by A.R. Archer.

History:

The SEYMOUR claims were staked in 1981 to the west of a block of claims held under various option agreements (GUDER, ESPERANZA, RAYROCK, etc.) and examined as part of the Freegold Project. Access to the property is via the Freegold Mine Road from Carmacks.

Description:

Paleozoic or older Yukon Metamorphic Complex metasediments have been intruded by three phases of Mesozoic intrusions, including foliated hornblende granodiorite of the Klotassin Batholith. Tertiary quartz feldspar porphyry stocks and dykes were accompanied by weak hydrothermal alteration, brecciation and quartz veining. Andesitic dykes of Eocene age were probably feeders for Mt. Nansen extrusive rocks.

Current Work and Results:

During 1981, geological mapping, soil sampling and bulldozer trenching were carried out on these claims. A total of 1,183 m^3 were excavated in old 1975 trenches to facilitate mapping.

On the SEYMOUR claims, a roughly elliptical 200 m by 490 m Tertiary porphyritic stock lies within a 425 m by 1,160 m area of dyke swarms, elongate to the northeast.

Hypogene alteration has been modified by overprinted supergene alteration. Alteration ranges from weakly developed potassic alteration in the stock through concentric intermediate to advanced phyllic and argillic alteration in the surrounding dyke swarm to widespread but weakly developed propylitic alteration in the surrounding granitic rocks.

Mineralization consists of pyrite and oxidized equivalents (trace to 5%), and trace chalcopyrite, azurite, malachite, molybdenite, pyrrhotite and arsenopyrite. Sulphide mineralization is best developed in or adjacent to phyllic alteration zones.

A total of 587 soil samples were collected and analyzed for Au, Cu and Mo. Using a threshold of 100 ppm Cu, anomalous Cu values outlined an area almost exactly coincident with the area of Tertiary intrusive activity with the highest Cu values at the northern end. Anomalous Au values (greater than 30 ppb Au) were scattered within and along the trend of Tertiary dyke swarms. Molybdenum values were weakly anomalous at the northern end of the Tertiary intrusive complex.

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1981 MINERAL CLAIMS STAKED

DD 115 I 3 (76)
L. Hodgson et al (62°02'N,137°08'W)

Claims 1981: DD (68)

FROG 115 I 5 (21)
Nat Joint Venture; (62°27'N,137°55'W)
Archer, Cathro and
Associates Limited

Claims 1981: LILYPAD (117); NEWT (8)

KLAZAN 115 I 6 (24)
Archer, Cathro and (62°23'N,137°29'W)
Associates Limited

Claims 1981: NITRO (24)

NUCLEUS 115 I 6 (64)
Nat Joint Venture (62°20'N,137°31'W)

Claims 1981: NUCLEUS (16)

ZIT 115 I 6 (69)
Arctic Red Resources (62°18'N,137°11'W)
Corporation

Claims 1981: SEYMOUR (44)

TINTA HILL 115 I 7 (37)
Silver Tusk Mines Limited (62°17'N,136°59'W)
Limited

Claims 1981: TINTA (24)

STU 115 I 7 (65)
United Keno Hill (62°21'N,137°45'W)
Mines Limited

Claims 1981: NOON (22)

ACE 115 I 7 (74)
H.A. Larson (62°18'N,137°37'W)

Claims 1981: ACE (3)

TAD 115 I 12 (19)
B. Harris et al (62°33'N,137°56'W)

Claims 1981: HAY (24)

NIT 115 I 12, J 9 (67)
Archer, Cathro and (62°33'N,138°01'W)
Associates Limited

Claims 1981: NIT (36)

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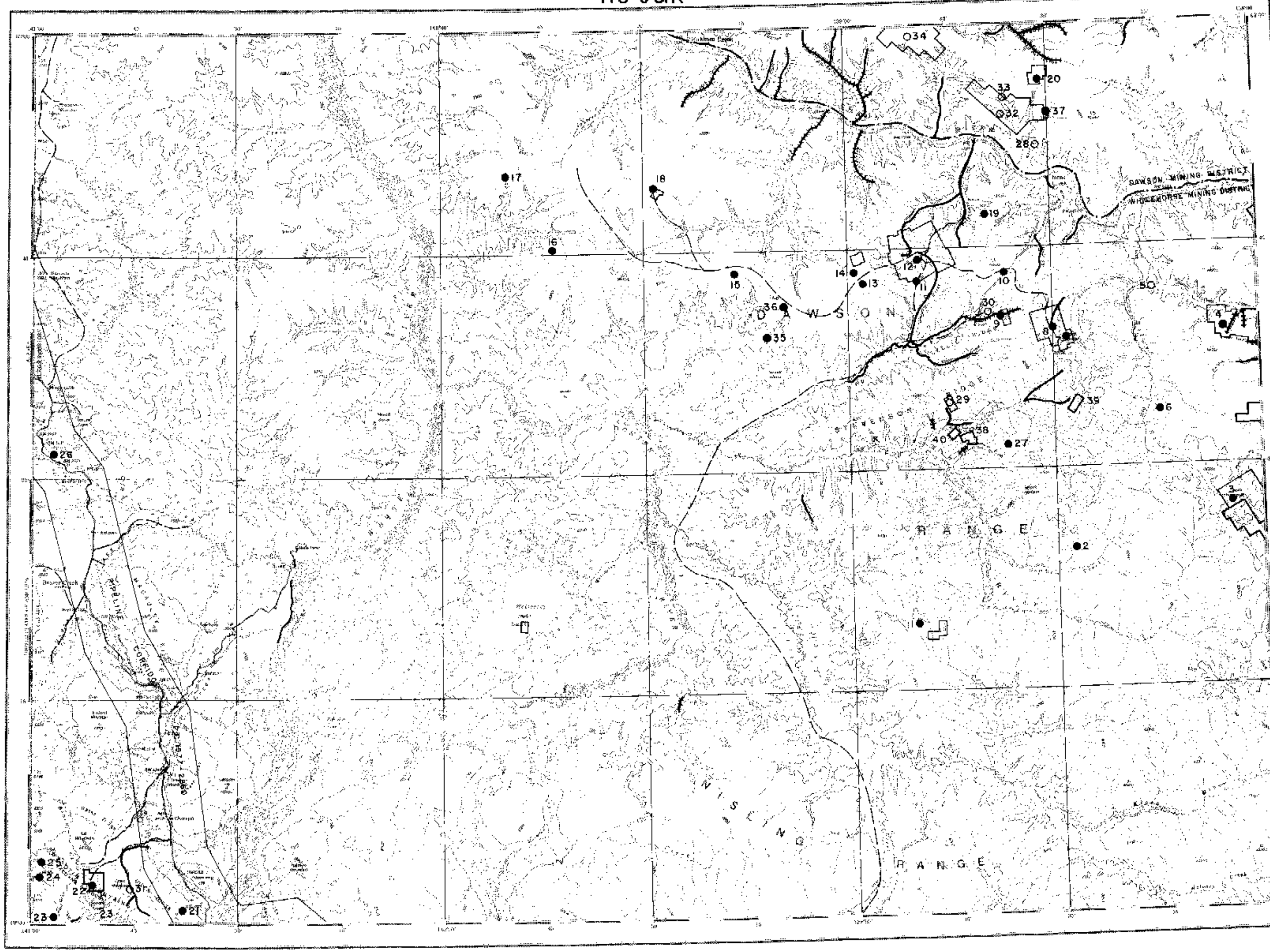
115 J&K



SNAG
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key or facing page

○72 .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan 1981

.... Mineral Claims staked in 1981

.... Prospecting Leases in good standing (April 1982)

.... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

.... Driveable Road

.... Oil or Gas Well

.... Airstrip

SNAG MAP-AREA (NTS 115 J/K)

General Reference: GSC Map 10-1973 and Paper 73-41 by: D.J. Tempelman-Kluit, 1973.

NO.	PROPERTY NAME	REFERENCE
1	KLOT	Craig & Milner (1975, p. 75)
2	SOMME	Craig & Laporte (1972, p. 72)
3	PRIDE	Copper Vein
4	HAYES	This Report
5	SELWYN	Bostock (1944)
6	CROCK	Craig & Laporte (1972, p. 68)
7	COCKFIELD	D.I.A.N.D. (1981, p. 265)
8	CO	D.I.A.N.D. (1981, p. 266)
9	RUDE CREEK	Craig & Laporte (1972, p. 63); Cockfield (1928, p. 11-13)
10	NORDEX	Silver-Lead Vein
11	BOMBER	Findlay (1967, p. 32-34)
12	CASINO	Craig & Laporte (1972, p. 55-57)
13	AZTEC	Craig & Laporte (1972, p. 54-55)
14	ZAPPA	D.I.A.N.D. (1981, p. 266, 267)
15	BOREAL	Craig & Laporte (1972, p. 42-43)
16	BID	Craig & Laporte (1972, p. 38-39)
17	VINA	Craig & Laporte (1972, p. 35-37)
18	TONI TIGER	Craig & Laporte (1972, p. 40-41)
19	MARGUERITE	Craig & Laporte (1972, p. 51-52)
20	SCROGGIE	D.I.A.N.D. (1981, p. 266)
21	ONION	Nickel-Copper-Molybdenum Magmatic
22	NUTZOTIN	D.I.A.N.D. (1981, p. 267); This Report
23	CALIFORNIA	Cairnes (1915, p. 123)
24	TRUDI	Copper-Molybdenum Porphyry
25	RIP	Cairnes (1915, p. 121-122)
26	BATRICK	Bostock (1952, p. 44-45)
27	PATTISON	Sinclair et al (1975, p. 94)
28	BRI	D.I.A.N.D. (1981, p. 267)
29	STEVENSON	D.I.A.N.D. (1981, p. 267)
30	LESLIE	D.I.A.N.D. (1981, p. 267)
31	CHAIR	D.I.A.N.D. (1981, p. 267)
32	NEF	D.I.A.N.D. (1981, p. 267)
33	MK	D.I.A.N.D. (1981, p. 267)
34	HASL	D.I.A.N.D. (1981, p. 267)
35	DOYLE	Sinclair et al (1976, p. 147)
36	COFFEE	Sinclair et al (1976, p. 147)
37	3 2 MANY	Morin et al (1980, p. 26)
38	WHISKY JOE	This Report
39	WOE	This Report
40	PAT	This Report

HAYES
Hudson Bay Exploration and Development Company Limited
Gold
115 J 9 (4)
(62°39'N,138°05'W)

References: D.I.A.N.D. (1981, p. 265); Sinclair et al (1975, p. 95-96).

Claims: SAM, SWEDE (102)

Current Work and Results:

Quartz veins in shear zones peripheral to a central rhyolite porphyry plug contain minor gold and base metal values. During 1981, an EM-16 survey was conducted on SAM 7-14, and six BQ diamond drill holes, totalling 812 m, were completed on SWEDE 5-6 and SAM 23, 25 and 26. The drilling was carried out to test a prominent northwest-trending shear zone and encountered only minor gold values.

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1981 MINERAL CLAIMS STAKED

WOE
J. Sigurdson et al
115 J 9 (39)
(62°34'N,138°27'W)

Claims 1981: WOE (10)

PAT
J. McMullen
115 J 10 (40)
(62°32'N,138°45'W)

Claims 1981: PAT (6)

WHISKY JOE
S. Paylor; V. Paylor
115 J 10 (38)
(62°32'N,138°42'W)

Claims 1981: WHISKEY JOE (8); ROSA (8)

NUTZOTIN
Skagway Moly Incorporated
115 K 2 (22)
(62°03'N,140°52'W)

Claims 1981: GOLD (10)

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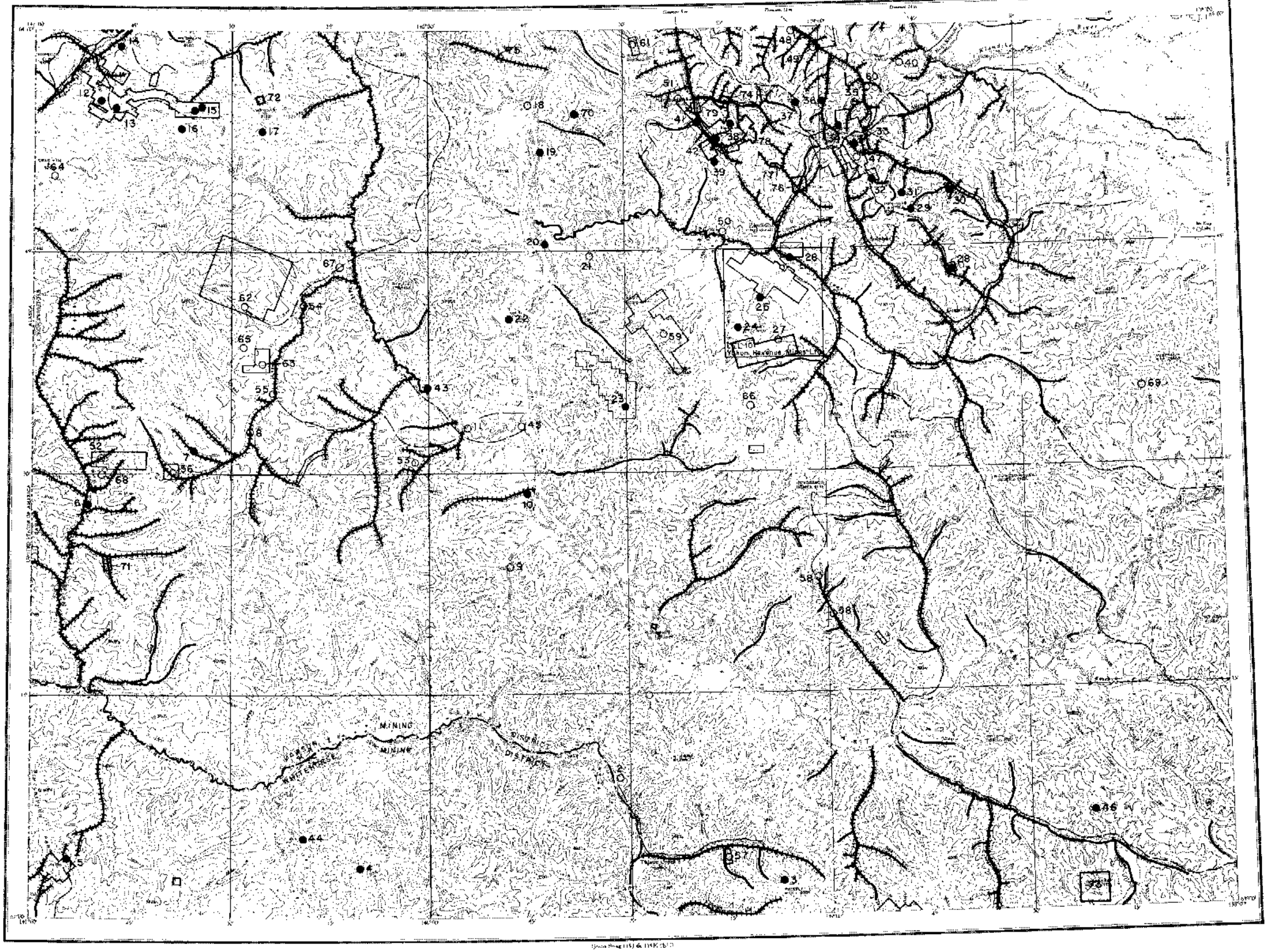
115 O&N



STEWART RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 ....Mineral Deposit or Occurrence see key on facing page	. . .Prospecting Leases in good standing (April 1982)	. Tote Trail
○72 ....Unmineralized Target	.....Placer Claims in good standing (April 1982)	.....Driveable Road
......Mineral Claims in good standing (Jan 1982) and staked before Jan 1981	CEL........Coal Exploration Licence	.... Oil or Gas Well
......Mineral Claims staked in 1981	CML........Coal Mining Lease	.... Airstrip

STEWART RIVER MAP-AREA (NTS 115 N/O)

General Reference: GSC Map 18-1973 and Paper 73-41 by: D.J. Tempelman-Kluit, 1974. GSC Map 117A by: H.S. Bostock, 1942 (for O)

NO.	PROPERTY NAME	REFERENCE
1	TREVA	
2	NORTHERN LIGHTS	
3	BLACK FOX	Cairnes (1917, p. 33-34)
4	ARIES	Copper-Molybdenum Occurrence
5	MOOSEHORN	Morin et al (1977, p. 33-54)
6	LADUE	Copper-Molybdenum Occurrence
7	SANTA	Silver-Lead-Tin Vein
8	SVENN	Cockfield (1921, p. 52)
9	EXCELSIOR	Canada Dept. of Mines (1914, p. 121)
10	COMET	
11	TENMILE	McConnell (1902, p. 25-39)
12	LUBRA	Silver-Lead-Gold Vein
13	CONNAUGHT	This Report
14	PER	Cockfield (1921, p. 52);Green (1966, p. 26-28)
15	BUTLER	Cockfield (1919, p. 8); Craig & Laporte (1972, p. 32-34)
16	FIFTY	Skarn Copper
17	ENCHANTMENT	Tempelman-Kluit (1973, p. 48-49)
18	MONTE CHRISTO	
19	PICKERING	Canada Dept. of Mines (1914, p. 120)
20	INDIAN	Asbestos
21	BISHOP	
22	WOOD	Skarn Copper
23	BURMEISTER	D.I.A.N.D. (1981, p. 271)
24	HAYSTACK	Canada Dept. of Mines (1914, p. 205)
25	MCKINNON	Gold Stratabound
26	RAVEN	Canada Dept. of Mines (1914, p. 74-75)
27	FOTHERGILL	Canada Dept. of Mines (1914, p. 71-74; This Report
28	AIME	Gold Vein
29	GOLD RUN	Canada Dept. of Mines (1914, p. 83-85)
30	PORTLAND	Canada Dept. of Mines (1914, p. 101-104)
31	DOMINION	Canada Dept. of Mines (1914, p. 86-87)
32	LLOYD	Canada Dept. of Mines (1914, p. 76-82)
33	HUNKER DOME	Brock (1910, p. 17-18); Canada Dept. of Mines (1914, p. 106, 112-114, 125)
34	MITCHELL	Canada Dept. of Mines (1914, p. 107-111); Gleeson (1970, p. 16-17); D.I.A.N.D. (1981, p. 271-274)
35	FAWCETT	Canada Dept. of Mines (1914, p. 107-111)
36	BUM	Gleeson (1970, p. 14-15); Craig & Milner (1975, p. 13)
37	BOX CAR	Canada Dept. of Mines (1914, p. 87-91); Gleeson (1970, p. 14)
38	LONE STAR	Canada Dept. of Mines (1914, p. 20-40); Gleeson (1970, p. 15-16); D.I.A.N.D. (1981, p. 274)
39	VIOLET	Canada Dept. of Mines (1914, p. 50-61); Gleeson (1970, p. 17); This Report
40	LEOTTA	
41	HILCHEY	D.I.A.N.D. (1981, p. 271, 274)
42	BUCKLAND	Green & Godwin (1963, p. 19); Gleeson (1970, p. 16)
43	SUSTAK	Iron Vein
44	PROSPECT	Copper Occurrence
45	CRUIKSHANK	Coal
46	MCMICHAEL	Copper Occurrence
47	GOLDEN ROD	
48	HEFFRING	
49	TRILBY	
50	TORRANCE	
51	BALD EAGLE	
52	STEVO	D.I.A.N.D. (1981, p. 271)
53	FLUME	D.I.A.N.D. (1981, p. 274)
54	TYRRELL	D.I.A.N.D. (1981, p. 274)
55	SNIP	D.I.A.N.D. (1981, p. 274)
56	DOLE	D.I.A.N.D. (1981, p. 274)
57	THIS	D.I.A.N.D. (1981, p. 274)
58	MAISY	D.I.A.N.D. (1981, p. 274)
59	RUBY	D.I.A.N.D. (1981, p. 274)
60	HUNK	D.I.A.N.D. (1981, p. 274)
61	MT. BRONSON	D.I.A.N.D. (1981, p. 272, 2/4)
62	JOVE	D.I.A.N.D. (1981, p. 272-273)
63	SON	D.I.A.N.D. (1981, p. 273)
64	CRAG	D.I.A.N.D. (1981, p. 273)
65	DOORMAT	D.I.A.N.D. (1981, p. 273)
66	BISMARK	Morin et al (1977, p. 138-139)
67	HEC-TOR	Morin et al (1980, p. 27)
68	BORD	Morin et al (1980, p. 27)
69	LIL	Morin et al (1980, p. 27)
70	RON	Morin et al (1980, p. 28)
71	BUD	This Report
72	MT. HART	This Report
73	PYROXENE	This Report
74	CIM	This Report
75	HUNG	This Report
76	READFORD	This Report
77	EVING	This Report
78	ORO	This Report
79	RT	This Report

CONNAUGHT
Lougheed Resources Incorporated

Silver, Lead, Copper, Molybdenum
115 N 15 (13)
(63°55'N, 140°50'W)

References: Craig and Laporte (1972, p. 32 - 34); D.I.A.N.D. (1981, p. 270).

Claims: JUDY 1-17

Source: Summary by K. Grapes from assessment report 090970 by G.C. Gutrath.

History:

The property has been worked on since 1965 (see Craig 1972). In 1974, Connaught Mines Limited dropped a portion of the property which was restaked by J.R. Lerner as the JUDY claims. Lougheed Resources Limited bought the claims from Lerner in 1981.

Description:

The JUDY claim group is located 64 km west of Dawson, extending east from the headwaters of Mosquito Creek 5 km south of its junction with the Sixtymile River.

The claims are underlain by Klondike Schist in contact on the west side of the claim group with Pelly Gneiss.

Current Work and Results:

In 1981, a trenching program was carried out on the previously mined Lerner lead-silver vein, located on the JUDY 2 claim. Three trenches were cut, two across the southwest strike of the vein zone and one across the northeast strike. The extension of the Lerner vein alteration shear zone was exposed in one of the trenches across the southwest strike of the vein.

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1981 MINERAL CLAIMS STAKED

BUD
R. Hilker
115 N 7 (71)
(63°24'N, 140°48'W)

Claims 1981: BUD (8)

MT. HART
L. Stevenson
115 N 16 (72)
(63°50'N, 140°25'W)

Claims 1981: SPORK (4)

PYROXENE
M. Barker et al
115 O 1 (73)
(63°01'N, 138°21'W)

Claims 1981: PY (64)

FOTHERGILL
S. Mynott et al
115 O 11 (27)
(63°38'N, 139°09'W)

Claims 1981: HAY (97)

HUNG
S. Yeates
115 O 13 (75)
(63°58'N, 139°49'W)

Claims 1981: HUNG

READFORD
W. Rasmussen et al
115 O 14 (76)
(63°49'N, 139°03'W)

Claims 1981: JAN; ILENE; LEE; KATHY; NANCY; MET; PAT; OGLA; CAN; ANN; ELLEN; GRACE; DON; BRET; FRAN; HELEN

EVING
N. Hausberg
115 O 14 (77)
(63°50'N, 139°07'W)

Claims 1981: EVING (3)

ORO
T. Coles
115 O 14 (78)
(63°52'N, 139°10'W)

Claims 1981: ORO (6)

RT
Dawson Eldorado Gold Exploration
115 O 14 (79)
(63°54'N, 139°17'W)

Claims 1981: AC (12); DE (13); RT (32)

VIOLET
M. Woods et al
115 O 14 (39)
(63°51'N, 139°17'W)

Claims 1981: VI (14)

CIM
R. Day
115 O 14 (74)
(63°55'N, 139°14'W)

Claims 1981: CIM (4)

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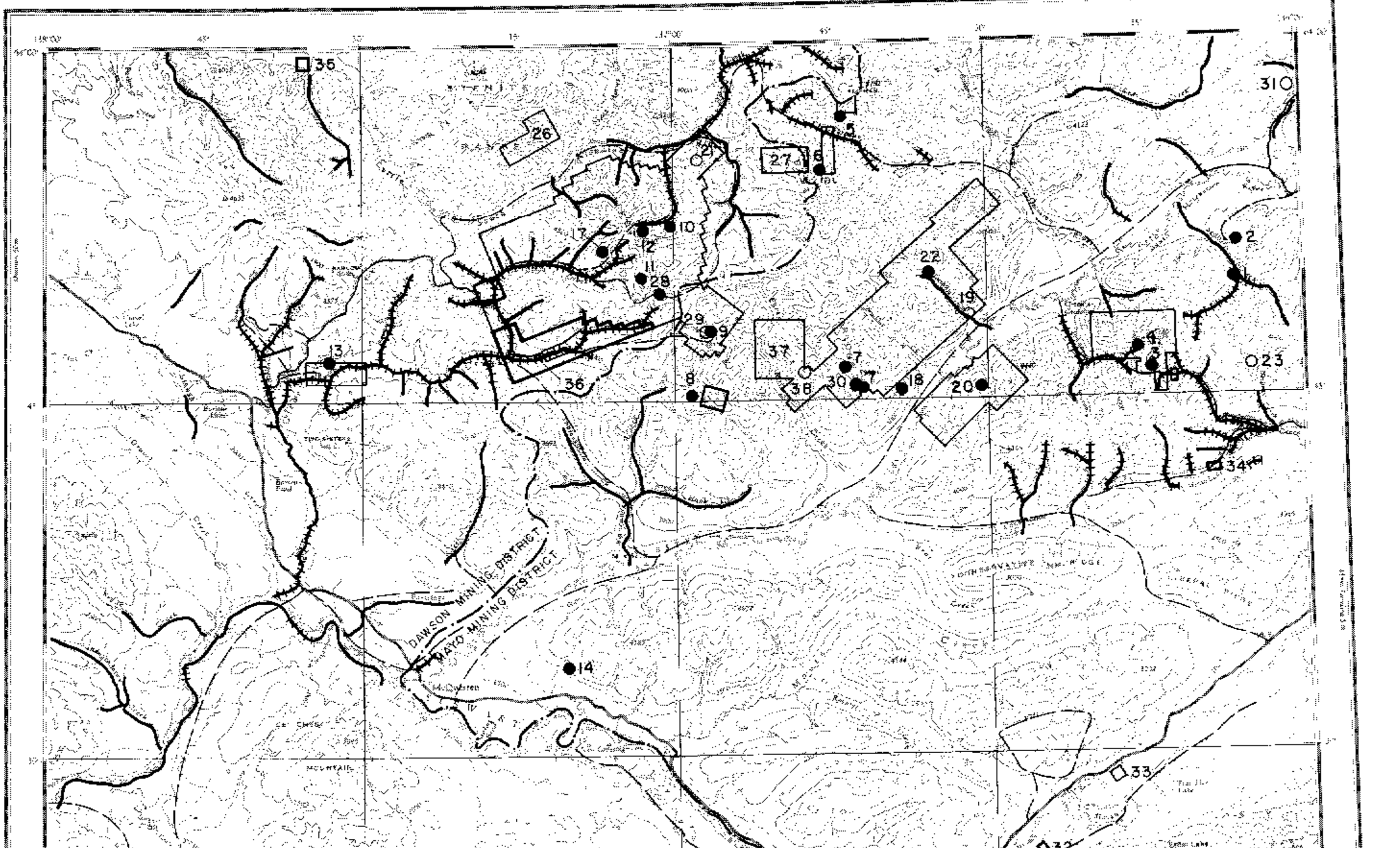
115 P



McQUESTEN
YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

.... Mineral Claims in good standing (Jan 1982) and staked before Jan. 1981

.... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

.... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

McQUESTEN MAP-AREA (NTS 115 P)

General Reference: GSC Map 1143A by: H.S. Bostock, 1942.

NO.	PROPERTY NAME	REFERENCE
1	JAYBEE	Silver-Lead Vein
2	SEATTLE	Green & Godwin (1964, p. 16)
3	HAWTHORNE	Green (1966, p. 20-21); Bostock (1941, p. 33-34)
4	SCHEELITE DOME	D.I.A.N.D. (1981, p. 277)
5	HOBO	D.I.A.N.D. (1981, p. 277)
6	SPRAGUE	Bostock (1948, p. 11)
7	EAST RIDGE	This Report
8	LUGDUSH	Craig & Milner (1975, p. 10); This Report
9	RIDGE	D.I.A.N.D. (1981, p. 278)
10	JOSEPHINE	This Report
11	RHOSGOBEL	This Report
12	PUKELMAN	This Report
13	CLEAR CREEK	Lang (1951, p. 14)
14	MOOSE RIDGE	Silver-Lead-Iron Occurrence
15	ROSEBUD	Bostock (1948, p. 12)
16	SETHER	
17	LEWIS	This Report
18	BOULDER	Bostock (1948, p. 11)
19	TOTH	
20	EPD	This Report
21	MOZI	D.I.A.N.D. (1981, p. 279)
22	SP	D.I.A.N.D. (1981, p. 279)
23	BEN	D.I.A.N.D. (1981, p. 279-280)
24	WOODBURN	D.I.A.N.D. (1981, p. 280)
25	CROOKED	D.I.A.N.D. (1981, p. 280)
26	FIONA	This Report
27	MAHTIN	This Report
28	JUBJUB	This Report
29	JABBERWOCK	This Report
30	MAY CREEK	Morin et al (1980, p. 22)
31	SECRET CREEK	Morin et al (1980, p. 22)
32	WINSLOW	This Report
33	PAN	This Report
34	SAVY	This Report
35	ACE	This Report
36	MARY	This Report
37	BANDER	This Report
38	SNATCH	This Report

EAST RIDGE
Billiton Canada Limited;
Campbell Resources Incorporated;
Inco Limited

Tin, Lead, Zinc, Silver
115 P 15 (7)
(63°48'N,136°39'W)

References: Bostock (1948, p. 11); Craig and Milner (1975, p. 20-21); D.I.A.N.D. (1981, p. 278); Morin et al (1980, p. 22).

Claims: SNARK 1-252; TEE 1-8

Source: Summary by K. Grapes from assessment report 090794 by B. Paul.

History:

The SNARK claims were staked by C.C.H. Resources in 1977 following the determination of tin and tungsten contents of heavy mineral concentrates from Boulder Creek.

Geological mapping and soil and stream sediment geochemical sampling programs were conducted in 1978 and 1979.

Description:

The area is underlain by metasedimentary rocks of Hadrynian age which are extensively intruded by biotite granodiorite and quartz monzonite stocks and dacite dykes.

Current Work and Results:

Geological surveys of 1:2,000 and 1:10,000 scale were completed over large portions of the SNARK Group in 1980, and over 3,300 soil samples were collected and analyzed for Sn, Pb, Zn, Ag and Au.

A 40 m trench was excavated to bedrock on a 1979 lead-silver soil anomaly.

Associations are: 1) tungsten, tin, zinc, copper and boron mineralization along the margins of the Molar granodiorite; 2) lead, silver and minor copper in breccia veins near the periphery of the Boulder Stock; 3) copper and minor lead in breccia veins or fractures near the periphery of the Sunshine Stock; 4) tin, zinc, boron and copper in skarn, and lead and silver in breccia veins removed from the Boulder Stock but adjacent to the Molar granodiorite body; and 5) tin, arsenic and boron in breccia veins removed from the Sunshine Stock.

The mineralized breccias can be subdivided into: a) tourmaline-rich breccia with accessory topaz and cassiterite, b) tourmaline and arsenopyrite-bearing breccia veins with a significant amount of silver, and c) brecciated quartz veins containing argentiferous galena, sphalerite, chalcopyrite and many secondary lead, copper and manganese minerals. The largest breccia vein is 15 m in width and over 250 m in strike length.

Skarns of variable composition occur as discrete horizons within the schists west of Boulder Creek. Almandine-diopside, grossular-diopside-epidote, almandine-diopside-calcite-axinite and quartz-calcite-chlorite-epidote varieties have all been identified. The most substantial of these skarn horizons outcrops east of the ORE showing where it is approximately 4 m in width.

Tin, zinc and silver were analyzed for in soils on two separate 100 m by 50 m grids north of the Boulder Creek Stock. Anomalous (greater than 50 ppm) but generally discontinuous tin values occur in soils. Stream sediments from Lovich and Zappa Creeks (local names) are reasonably high in tin, reaching 71 and 48 ppm Sn respectively. Silver values are low to absent throughout most of the two grid area. Mildly anomalous zinc values occur in association with screeslope gossan. In the Zappa Creek area, zinc values greater than 300 ppm appear to coincide with enhanced tin values.

Grab samples of the actinolite skarn assay from 0.24 to 0.41% Sn. The brecciated quartz veins assay 3.60% to 17.80% Pb, 2.5% Zn and 150 to 250 ppm Ag, and the tourmaline breccia from 0.19% to 0.3% Sn.

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CLEAR CREEK EAST	Tungsten, Gold, Tin
(LEWIS, RHOSGOBEL,	115 P 14, 15
JOSEPHINE, PUKELMAN)	(10,11,12,17,28)
Canada Tungsten Mining	(63°47' - 63°56'N,
Corporation Limited	136°57' - 137°20'W)

References: Aho (1949); Bostock (1948, p. 11; 1964; 1979); D.I.A.N.D. (1981, p. 276-280); Garrett (1971); Green (1972); Roddick (1967); Tempelman-Kluit (1975, 1976).

Claims: C.C 1-860; SLUGGO 1-20; RAIN 1-30; BEE 1-14

Source: Summary by K. Grapes from assessment report 090926 by R.H. Rainbird and D.A. Kelly.

History:

The property now comprises 1,054 quartz claims. All claims are owned by Canada Tungsten Mining Corporation Limited, except for the RAIN 1-30 and BEE 1-14 which were optioned from A.E. Thom et al in 1978.

This area has been actively explored for placer gold and gold-silver-lead-zinc veins since the early 1900's. Recently, exploration has focused on tungsten, tin and gold mineralization associated with small hypabyssal stocks. In 1980, Canada Tungsten Mining Corporation Limited conducted a regional geological and heavy mineral sampling program which outlined two tungsten-gold targets and one tin target.

Description:

The claim block is located 100 km east of Dawson City. The southern portion of the property is accessible by four-wheel drive vehicle from the Klondike Highway via the Clear Creek Road turnoff.

The property is underlain by a thick succession of mildly deformed, shallow-dipping metapelite of Proterozoic age (Grit Unit). Grit Unit rocks have been intruded by several phases of Middle to Late Cretaceous acid plutonic and hypabyssal rocks. Mineralization occurs in the form of scheelite-bearing calc-silicate skarn, scheelite and auriferous arsenopyrite-bearing quartz stockworks and possibly tin-bearing acid plutons.

Current Work and Results:

A geological and geochemical exploration program was carried out in 1981. Geological work included reconnaissance geological mapping of the entire claim block at 1:10,000 scale and detailed mapping of five grids at 1:5,000 scale. Geochemical work comprised rock chip, heavy mineral, sludge, stream sediment and soil sampling of selected areas.

Three distinct types of mineral occurrences have been recognized: 1) scheelite-bearing calc-silicate skarn; 2) scheelite and auriferous arsenopyrite-bearing quartz vein stockworks; and 3) possible cassiterite-bearing greisen-breccia.

Rock chips of dark skarn assay up to 1.31% WO_3. Assays of rock chips from the auriferous quartz vein stockworks give values up to 45.0 g Au/t and 45.6 g Ag/t.

Approximately 2,660 soil samples were collected from the five grids and analyzed for Sn, W and Au. Most grids have sporadic tungsten and gold anomalies. The RHOSGOBEL grid produced three anomalous zones. A gold anomaly averaging 300 ppb over 800 m occurs in the hornfels south of Pukelman Stock to the north. In the central area of the grid a strong northeast-trending tungsten-gold anomaly approximately 1,000 m in length and 400 m wide occurs over quartz-monzonite porphyry. An east-west-trending tungsten anomaly, ranging from 40 ppm to 560 ppm, is coincident with the south contact of the Rhosgobel Stock.

Forty heavy mineral samples were collected and analyzed. The headwaters of Lewis Gulch and Left Clear Creek are anomalous in tungsten and gold; the southerly draining tributaries to Clear Creek are anomalous in tin.

Sludge samples did not delineate any specific anomalous areas.

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EPD
Billiton Canada Limited; Campbell Resources Incorporated; Inco Limited

Tin
115 P 10,15,16 (20)
(63°45' - 63°47'N, 136°27' - 136°30'W)

References: D.I.A.N.D. (1981, p. 277, 278-279); Morin et al (1980, p. 22).

Claims: LAMB 1-26; FLAG 1-12

Source: Summary by K. Grapes from assessment reports 090809 and 090829 by A. Woodsend.

History:

The LAMB and FLAG claims were staked in 1979 for the Cortin Joint Venture by Campbell Resources Incorporated as protection for the EPD group.

Current Work and Results:

Two short sample lines were run across the granitic contact on the LAMB claims, and two lines were run and sampled at 50 m intervals over the FLAG claims. Samples were analyzed for Sn, Cu, Pb, Ag, W and Zn. Results were disappointing with a few weak zinc anomalies.

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FIONA
Mattagami Lake Exploration Limited

Unmineralized Target
115 P 14 (26)
(63°56'N,137°15'W)

Reference: D.I.A.N.D. (1981, p. 279, 280).

Claims: FIONA 1-47, 69

Source: Summary by K. Grapes from assessment report 090984 by J. Biczok.

History:

The FIONA claims were staked in 1980 to cover stream geochemical anomalies in areas of favourable geology.

Description:

The property is located 26 km east of Dawson City in the Syenite Range, 10 km northeast of Barlow Dome on the Clear Creek Road.

The claims cover the intrusive contact of a Cretaceous syenite to monzonite intrusion with a series of Ordovician carbonate and clastic sedimentary rocks. Ordovician limestone is overlain by an Ordovician-Silurian sequence of quartzite, conglomerate and shale. The Cretaceous "Lost Horses" Stock is a roughly circular intrusion, 8 km in diameter with numerous associated dykes of syenite to monzonite.

Current Work and Results:

Geological mapping on a 1:20,000 scale, four stream sediment and 16 rock samples were collected during the 1981 field season. Samples were analyzed for Cu, Pb, Zn, Ag, Mo, W, Sn and Au.

No surface skarn mineralization was discovered on the claims, and geochemical analyses did not delineate any anomalies.

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MAHTIN
Billiton Canada Limited; Campbell Resources Incorporated; Inco Limited

Tin, Tungsten
115 P 15 (27)
(63°55'N,136°50'W)

References: D.I.A.N.D. (1981, p. 277, 280).

Claims: MAHTIN 1-32

Source: Summary by K. Grapes from assessment report 090808 by B. Paul and assessment report 090956 by B. Paul and D. Rota.

History:

Galena-bearing veins were discovered at the north end of EAST RIDGE in 1948 by the Geological Survey of Canada. The presence of very old claim posts along the ridge suggests that the area has been previously examined.

Description:

The property is underlain by a sedimentary sequence of Ordovician age Road River Formation. The rocks young to the north, passing from siltstone, chert and limestone into argillite and calcarenite. Metasedimentary rocks of Hadrynian age occur in the southeast corner of the property, having been thrust northwards over the Ordovician rocks. The rocks are intruded by a biotite-quartz monzonite stock, as well as an east-west trending monzonitic to syenitic dyke swarm. Skarn and hornfels are developed adjacent to the quartz monzonite intrusive.

Current Work and Results:

A geological survey at 1:10,000 scale was completed and over 1,100 soil samples were collected for Sn, W, Cu, Zn, Ag and As analyses during June, 1980. Another 203 soil samples were collected in the southeast corner of the property during August, 1981.

Mineralization can be divided into two types. 1) Arsenopyrite, pyrite, stibnite and chalcopyrite are found in association with quartz, calcite, tourmaline and sericite in fracture veinlets within the quartz monzonite. Analysis of the richer arsenopyrite samples gave values of greater than 100 ppm Ag but low Au values. 2) Pyrrhotite, pyrite, arsenopyrite and chalcopyrite are found in accessory amounts with almandine, diopside, calcite and tremolite in skarn horizons.

Soil sampling delineated a circular arsenic anomaly, approximately 700 m in diameter, partially coincident with the intrusive quartz monzonite contact to the southwest.

Tin values in soil are generally low and only moderate values coincide with the arsenic anomaly. However, highly anomalous tin values occur in stream sediments and panned concentrates. Tungsten, copper and zinc values are generally low.

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JABBERWOCK
Billiton Canada Limited;
Campbell Resources
Incorporated;
Inco Limited

Tin
115 P 15 (29)
(63°48'N,136°57'W)

References: Bostock (1964); Morin et al (1980, p. 22-23).

Claims: JABBERWOCK 1-24, 31-65

Source: Summary by K. Grapes from assessment reports 090796 by B. Paul, and 091008 by B. Paul and D. Rota.

History:

C.C.H. Resources Limited staked the JABBERWOCK Group upstream from very high stream sediment values in Fortymile Creek in 1978. This ground was once covered by the STERLING claims. During the summer of 1978, reconnaissance soil and stream sediment geochemical sampling was conducted.

Description:

The property is underlain by metasedimentary rocks of Hadrynian age intruded by small syenitic plugs and biotite-K-feldspar porphyry dykes.

Cassiterite occurs in vuggy arsenopyrite-tourmaline-bearing breccia veins, in fissure veinlets with K-feldspar and in vuggy quartz-Fe oxide filled fractures.

Current Work and Results:

During August, 1979 and June, 1980, geological surveys of 1:10,000 and 1:1,000 scale and a soil geochemical survey were conducted. Soil samples were analyzed for Sn, Ag and As.

Three types of mineralization occur. 1) Vuggy tourmaline and arsenopyrite-bearing breccia veins with accessory cassiterite and pyrrhotite contain relatively high silver values (up to 64 ppm Ag). 2) "Dry" fissure filling cassiterite is black and "squashed" in appearance. These fissures or veinlets are relatively rare but are visually spectacular and of very good grade. 3) Vuggy, thin, quartz-filled fractures with iron oxide are the most common tin-bearing structures. Cassiterite occurs as euhedral dark brown to translucent crystals on the fracture surfaces.

Tin values greater than 50 ppm occur coincident with arsenic values greater than 500 ppm in soil on the talus slopes of the main ridge.

A limited amount of prospecting in the southern portion of the claim group and rock sampling of the intrusive lying to the south of the claim block were conducted during 1981. Three large samples of the granite were analyzed for major, minor and trace elements. Results were compared with other granites associated with tin deposits in the Mayo-McQuesten area.

******

BANDER
Billiton Canada Limited;
Campbell Resources
Incorporated;
Inco Limited

Tin
115 P 15 (37)
(63°46'N,136°49'W)

Claims: BANDER 1-80

Source: Summary by K. Grapes from assessment report 090810 by A. Woodsend and assessment report 090954 by B. Paul and D. Rota.

History:

The BANDER claims were staked in 1979 following a reconnaissance stream sediment geochemistry program carried out in 1978. Several high tin values were located.

In August, 1979, claim lines were sampled at 50 m intervals. The samples were analyzed for Sn, W, Cu, Pb, Zn and Ag. Only a few sporadic zinc anomalies were determined. Work during 1980 was confined to a heavy mineral study which outlined several moderately anomalous areas.

Description:

The BANDER claim group covers an area of approximately 1,670 hectares to the east of Fortymile Creek, 51 km northwest of Mayo.

The claims are underlain by gently to moderately dipping schist, argillite, limestone and quartz-feldspar crystal tuff, all Hadrynian in age. The metasedimentary rocks are of low to moderate metamorphic rank with many primary sedimentary structures preserved. Intruding the metasedimentary rocks are feldspathic and biotite-lamprophyre dykes, quartz diorite and granite porphyry of Cretaceous age.

Accessory amounts of galena and arsenopyrite occur locally in quartz-carbonate veins.

Current Work and Results:

In 1981, geological mapping, soil and stream geochemistry and heavy mineral sampling were carried out.

Tin, zinc, silver and arsenic were analyzed for, in soils collected over a 100 m by 50 m grid in the west-central portion of the claim group. Moderately anomalous values in silver (13.5 ppm maximum), arsenic (750 ppm maximum) and zinc (2,150 ppm maximum) were found in the northern half of the grid area. Tin values were low, peaking at 15 ppm. The stream sediment and heavy mineral surveys returned low values of Sn, Zn, Ag, As, W, Cu and Pb.

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SNATCH
Billiton Canada Limited;
Campbell Resources
Incorporated;
Inco Limited

Lead, Silver
115 P 15 (38)
(63°46'N,136°47'W)

Claims: SNATCH 1-8, 21, 23, 25, 27

Source: Summary by K. Grapes from assessment reports 090962 and 090963 by B. Paul and D. Rota.

History:

The SNATCH claims were staked in 1979 to cover highly anomalous tin stream sediment values located the summer before. Soil sampling in 1979 outlined highly anomalous silver values in the north of the claim group.

Description:

The SNATCH claims are located between the Fortymile and May Creeks, 51 km northwest of Mayo.

The claims are underlain by gently- to moderately-dipping schist, argillite, limestone and quartz-feldspar crystal tuff, Hadrynian in age. The metasedimentary rocks are of low- to moderate-metamorphic rank with many of the primary sedimentary structures preserved. Intruding these rocks are feldspathic and biotite-lamprophyric dykes, quartz diorite and granite porphyries of Cretaceous age.

Small scale nappe folding with an east-northeast axial trend is common. An (S_2) axial plane cleavage has developed parallel to the fold axes.

Minor amounts of galena and arsenopyrite are present in a few quartz-carbonate veins.

Current Work and Results:

A geological survey at 1:10,000 scale was conducted and a line of 13 soil geochemistry samples in the area of high silver values were collected in June, 1981.

Highly anomalous values of lead (450 ppm) and silver (37.5 ppm) confirmed the results of previous geochemical surveys.

Further soil sampling was carried out in the anomalous area in September, 1981. Eighty soil samples were collected and analyzed for lead and silver. Results delineated an east-trending geochemical anomaly with lead values greater than 300 ppm and silver values greater than 10 ppm in the northern apex of the claim group.

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1981 MINERAL CLAIMS STAKED

WINSLOW
O. Ramsey

115 P 8 (32)
(63°26'N,136°26'W)

Claims 1981: WINSLOW

PAN
D. Brown; S. Schmidt

115 P 8 (33)
(63°29'N,136°19'W)

Claims 1981: PAN (4)

SAVY
W. Tuck

115 P 9 (34)
(63°42'N,136°09'W)

Claims 1981: SAVY (2)

ACE
L. Doey

115 P 13 (35)
(63°59'N,137°36'W)

Claims 1981: ACE (4)

LEWIS
Canada Tungsten

115 P 14 (17)
(63°51'N,137°07'W)

Claims 1981: CC (151)

MARY
B. Rittel

115 P 14 (36)
(63°47'N,137°15'W)

Claims 1981: MARY (8)

LUGDUSH
Canada Tungsten

115 P 15 (8)
(63°45'N,136°56'W)

Claims 1981: SPUD (16)

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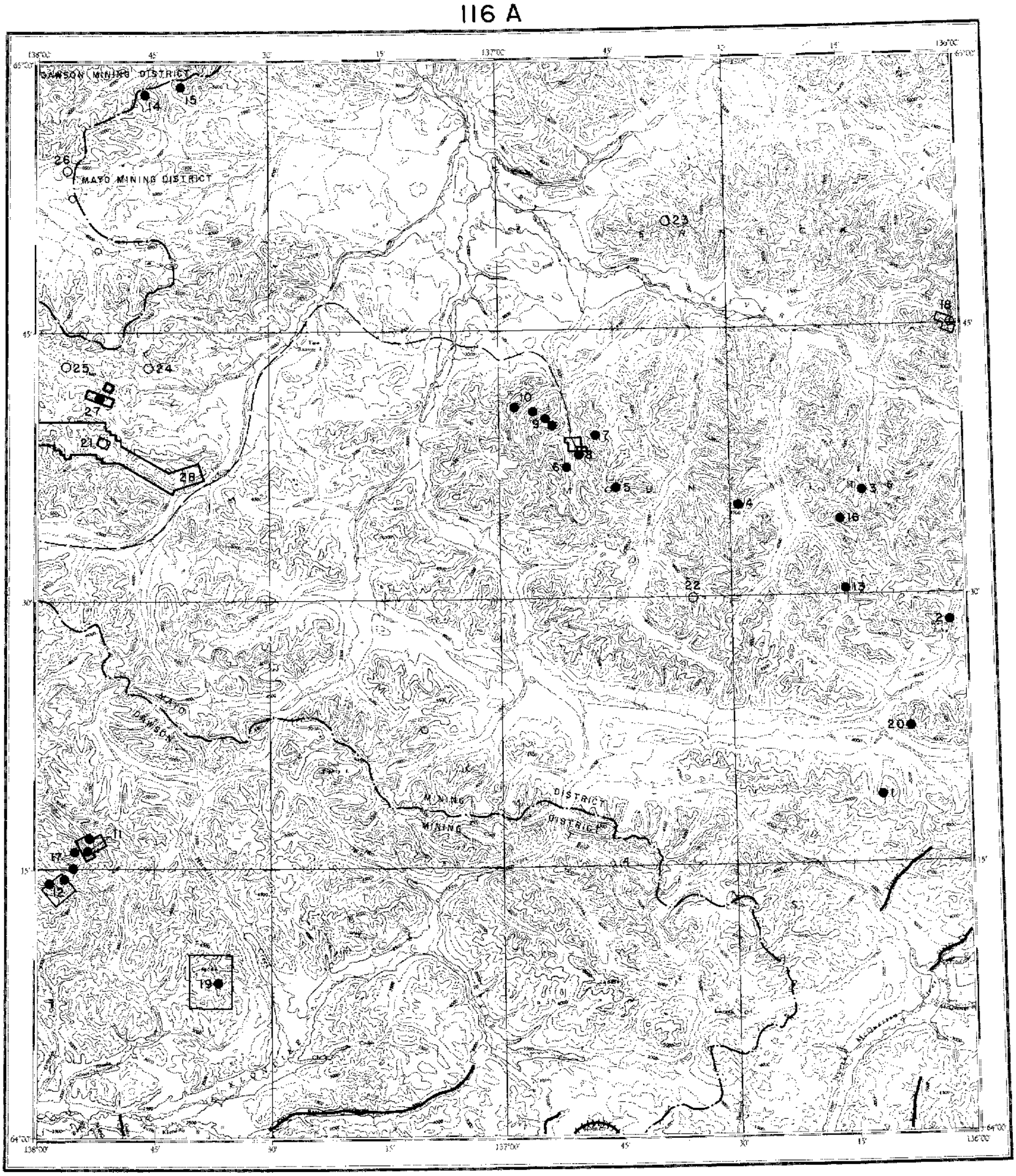
116 A



LARSEN CREEK

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

..... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

LARSEN CREEK MAP-AREA (NTS 116 A)

General Reference: GSC Map 1283A and Memoir 364 by: L.H. Green, 1972.

NO.	PROPERTY NAME	REFERENCE
1	TIMBERWOLF	Copper Vein
2	WORM	Copper Vein
3	RAMA	Copper-Silver-Lead Vein
4	MATTSON	Copper Vein
5	SOUP	Copper Vein
6	REINDEER	Copper-Lead
7	GRACE	Craig & Laporte (1972, p. 26-27)
8	HART RIVER	Morin et al (1979, p. 22-24); This Report
9	BELCARRA	Copper-Lead-Zinc Vein
10	ZEBRA	Green (1972, p. 140); Craig & Laporte (1972, p. 23-25)
11	HAMILTON	Gold-Copper-Silver-Bismuth Vein; This Report
12	RIMROCK	This Report
13	AUSTON	Green (1972, p. 140)
14	HOT	Sinclair et al (1975, p. 76-77)
15	MICHELLE	Sinclair et al (1975, p. 71)
16	BRUK	Lead-Zinc Vein
17	PHILP	Skarn Copper-Gold Silver
18	DALE	This Report
19	IDA	This Report
20	STROKER	This Report
21	NO BEAVER (ST. BRIDGET)	This Report
22	SUMI	Morin et al (1977, p. 135)
23	WERN	Morin et al (1977, p. 135-136)
24	TIM	Morin et al (1979, p. 50)
25	SHAY	Morin et al (1979, p. 50)
26	LEP	Morin et al (1979, p. 50)
27	LOMOND CREEK	Morin et al (1979, p. 49)
28	BOYLE	This Report

RIMROCK
Anaconda Canada Exploration Limited

Silver Veins
116 A 4 (12)
(64°14'N,137°57'W)

References: D.I.A.N.D. (1981, p. 281-282); GSC, Open File Report 519 (1978); Green (1972).

Claims: LAKE 1-30

Source: Summary by K. Grapes from assessment report 090917 by R. Hall.

History:

The LAKE claims, staked in August, 1980, cover part of the lapsed AUSSIE claims.

Description:

The claims are located in the southern Ogilvie Mountains on the east side of the Brewery Creek drainage, approximately 14 km southeast of Antimony Mountain.

The claim block is underlain by a tectonically imbricated calcareous sedimentary sequence, probably correlative with the Cambro-Ordovician Keckika Group. Sedimentary rocks are cut by a small stock and dyke swarms of porphyritic quartz monzonite.

Current Work and Results:

During August 1981, the property was mapped on a scale of 1:10,000, prospected and sampled.

Principal vein systems are confined to recessive rusty-weathering fault zones cutting calc-silicate hornfels. Veins are commonly spatially associated with chloritized porphyritic quartz monzonite dykes.

Two veins approximately 1 m in width, and traceable over a strike length of about 100 m, were sampled. Three 10 kg chip samples were collected over the width of each vein. Assay results for one of the veins ran slightly in excess of 350 g Ag/t over 0.6 m for much of the strike length.

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DALE
Mattagami Lake Exploration Limited

Copper Vein
116 A 9, 16,
106 D 12, 13 (18)
(64°45'N,135°58'W)

Reference: D.I.A.N.D (1981, p. 282).

Claims: MELA 1-52; DALE 1-14

Source: Summary by K. Grapes from assessment report 091006 by J. Biczok.

History:

The DALE 1-14 claims were staked in 1978 following the discovery of trace galena-chalcopyrite mineralization. Geological mapping and stream sediment geochemical sampling carried out in 1979 and 1980 resulted in the staking of the MELA 1-52 claims in August, 1980.

Current Work and Results:

During the 1981 field season the MELA claims were mapped on a scale of 1:10,000. Rock samples were collected and analyzed for Cu, Pb, Zn, Mo, Ag, Ni, Co, As, Au and Sb.

Chalcopyrite occurs in narrow discontinuous quartz veins found throughout the area and in a siderite vein four km long and up to six m wide. Specular hematite occurs as thin flakes up to two cm across, in quartz veins associated with amphibolitized gabbro dykes. Six samples of the amphibolitized gabbro were analyzed. All returned low values.

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IDA
Riocanex Inc.

Gold
116 A 4 (19)
(64°09'N,137°37'W)

Reference: D.I.A.N.D. (1981, p. 282).

Claims: IDA 1-120

Source: Summary by K. Grapes from assessment report 090908 by J. McClintock.

Current Work and Results:

In 1981, a program of further rock-chip sampling and trenching was undertaken.

A total of 486 rock-chip samples were collected and analyzed for gold. Results of rock-chip sampling revealed an east-trending 800 m by 300 m area in which samples averaged 0.5 g Au/t.

A total of 51 trenches in three areas around the 800 m by 300 m zone were blasted. Trenching discovered two separate parts of the auriferous region in which gold grades exceeded 5.0 g Au/t.

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STROKER
Riocanex Inc.

Gold
116 A 8 (20)
(64°25'N,136°08'W)

Reference: D.I.A.N.D. (1981, p. 282).

Claims: STROKER 1-40

Description:

The claims are underlain by Precambrian to Cambrian silici-clastic rocks which form the southern limb of a large, east-trending anticline.

Current Work and Results:

The claims were mapped on a scale of 1:5,000 and 600 rock-chip samples were collected and analyzed for gold. Up to 3.4 g Au/t occurs over areas less than three m in isolated fracture zones occupying the hinge zones of minor folds within the limb of the main anticline.

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NO BEAVER (ST. BRIDGET)
Milchem Canada Limited

Barite
116 A 12,
116 B 9 (28)
(64°39'N,137°52'W)

Reference: D.I.A.N.D (1981, p. 282).

Claims: ST. BRIDGET 1-138; MILKUM 1-56

Current Work and Results:

The ST. BRIDGET and MILKUM claims were staked in 1981. During the summer of 1981 the ST. BRIDGET claims were mapped on 1:50,000 and 1:10,000 scales. Mapping has extended a bedded barite occurrence in black siliceous shales of the Road River Formation.

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1981 MINERAL CLAIMS STAKED

HAMILTON
S. Young et al

116 A 5 (11)
(64°16'N,137°53'W)

Claims 1981: AINE (24)

HEART RIVER
H. Wahl

116 A 10 (8)
(64°38'N,136°50'W)

Claims 1981: ARK (10)

BOYLE
Cominco Limited

116 A 12 (28)
(64°37'N,137°41'W)

Claims 1981: BOYLE (32)

NO BEAVER (ST. BRIDGET)
Millchem Canada Ltd.

116 A 12 (21)
(64°39'N,137°52'W)

Claims 1981: ST. BRIDGET (138); MILKUM (56)

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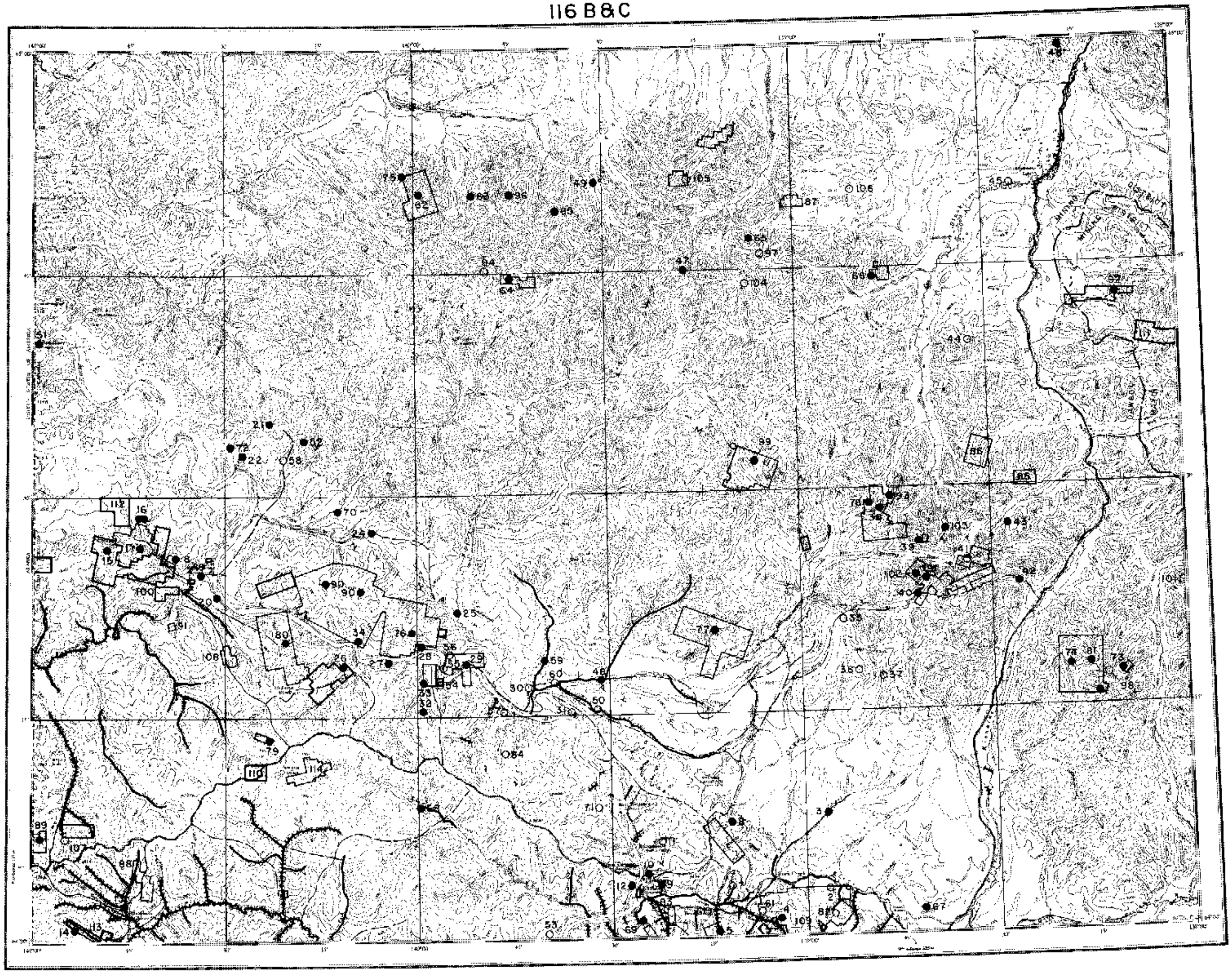
116 B&C



DAWSON

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

- ●61 .... Mineral Deposit or Occurrence see key on facing page
- ○72 .... Unmineralized Target
- .... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
- .... Mineral Claims staked in 1981
- .... Prospecting Leases in good standing (April 1982)
- .... Placer Claims in good standing (April 1982)
- CEL .... Coal Exploration Licence
- CML .... Coal Mining Lease
- .... Tote Trail
- .... Driveable Road
- .... Oil or Gas Well
- .... Airstrip

DAWSON MAP-AREA (NTS 116 B/C)

General Reference: GSC Map 1284A and Memoir 364 by: L.H. Green, 1972.

NO.	PROPERTY NAME	REFERENCE
1	INDEX	Green (1972, p. 142)
2	GERMAINE	Green (1964, p. 64-65)
3	COLLIERY	Bostock (1938, p. 13-14); Green (1972, p. 27); Dowling (1915)
4	UNEXPECTED	This Report
5	VIRGIN	Canada Dept. of Mines (1914, p. 41-49); D.I.A.N.D. (1981, p. 293)
6	MacLEAN	Canada Dept. of Mines (1914, p. 125)
7	BOYLE	
8	LEPINE	Canada Dept. of Mines (1914, p. 114-119); D.I.A.N.D. (1981, p. 293)
9	FIBRE	Asbestos
10	MIDNIGHT DOME	Asbestos
11	BROAD-LEDGE	Brock (1910, p. 15)
12	WEST DAWSON	Copper-Lead-Silver Skarn, Vein
13	HUNGRY	Cockfield (1921, p. 52)
14	MILLER	Cockfield (1921, p. 51-52); D.I.A.N.D. (1981, p. 293)
15	SPHERE	Sinclair & Gilbert (1975, p. 31); This Report
16	FOXY	Green (1964, p. 27)
17	CLINTON CREEK	McConnell (1890); Green (1964, p. 25-27); Sinclair et al (1975, p. 72-73); This Report
18	ACHERON	Asbestos
19	CONE HILL	Silver-Lead-Gold Vein; This Report
20	MICKEY	Asbestos
21	SHELL CREEK	Gross (1969, p. 111)
22	CLIFF	McConnell (1904, p. 39-41)
23		Dowling (1915)
24	SOURDOUGH MINE	McConnell (1904); Green (1972, p. 146)
25	FIF	McConnell (1903, p. 39-41)
26	CALEY	Green (1964, p. 27-28); This Report
27	SUBMARINE	Cockfield (1928, p. 9)
28	ROAL	Cockfield (1928, p. 9)
29	SILVER CITY	Green (1966, p. 23-24); Craig & Laporte (1975, p. 15-16)
30	OGILVIE	
31	KEYSTONE	
32	ASS	Asbestos
33	WOODCHOPPER	This Report
34	ETHELDA	Copper Skarn
35	HAY MEADOW	
36	JECKELL	
37	SNYDER	
38	FIREWEED	Tempelman-Kluit (1965, p. 36)
39	GRAVE	D.I.A.N.D. (1981, p. 285)
40	SPOTTED FAWN	Cockfield (1919, p. 15-17); Green (1972, p. 137-138); Sinclair et al (1975, p. 73-74)
41	SUBTRACT	D.I.A.N.D. (1981, p. 285)
42	ROBERT SERVICE	Tempelman-Kluit (1965, p. 36)
43	MULTIPLY	Tempelman-Kluit (1965, p. 36)
44	CRAWFORD	Copper Vein
45	BLACKSTONE	Coal
46	CHAPMAN	Sinclair et al (1975, p. 76); Green (1972, p. 138)
47	FIFTEEN MILE	Copper-Silver Vein
48	CHANDINDU	McConnell (1903, p. 39-41)
49	SHAND	Copper
50	JEROME	Coal
51	PAULA	Owen (1968, p. 8)
52	KRAUSE	Iron Stratabound
53	MASTADON	
54	RISCO	
55	WINAGE	
56	HEALY	
57	LAWRENCE	
58	LEDUC	Coal
59	BARETTE	Coal
60	THANE	Coal
61	HATTIE	Canada Dept. of Mines (1914, p. 124-125)
62	MONSTER	Lead-Zinc Vein, Stratabound
63	TART	Zinc-Lead
64	OZ	Sinclair et al (1975, p. 74-75)
65	SEELA	Lead-Zinc Vein
66	KIWI	Sinclair et al (1975, p. 75)
67	MORRISON	G.S.C., Map 711 A (1942)
68	LOWNEY	
69	HALIFAX	D.I.A.N.D. (1981, p. 293)
70	CHAIN	Coal
71	HALE	
72	JEPHSON	Coal
73	O'BRIEN	Gold Vein
74	SANDOW	Green (1972, p. 142)
75	UGLY	Zinc-Lead Vein
76	TJOP	D.I.A.N.D. (1981, p. 285); This Report
77	STYX	This Report
78	MARN	This Report
79	CLIP	D.I.A.N.D. (1981, p. 288)
80	PLUTO	This Report
81	THOR	D.I.A.N.D. (1981, p. 289-291)
82	ETC	D.I.A.N.D. (1981, p. 293)
83	FROGGY	D.I.A.N.D. (1981, p. 293)
84	FRESNO	D.I.A.N.D. (1981, p. 293)
85	RIKI	This Report
86	TAK	This Report
87	KITL	This Report
88	GUCH	This Report
89	BALDY	D.I.A.N.D. (1981, p. 292)
90	RAIL	This Report
91	MAIDEN	D.I.A.N.D. (1981, p. 292)
92	REIN	D.I.A.N.D. (1981, p. 292)
93	NEBULOUS	D.I.A.N.D. (1981, p. 293)
94	DEM	Sinclair et al (1976, p. 85)
95	OD	Sinclair et al (1976, p. 86)
96	ID	Sinclair et al (1976, p. 87)
97	KIMI	Sinclair et al (1976, p. 88)
98	MONY	Morin et al (1977, p. 142)
99	GULCH	Morin et al (1977, p. 143)
100	ROSE	This Report
101	HOT	Morin et al (1979, p. 53-54)
102	TETA	Morin et al (1979, p. 54)
103	SUMTING	Morin et al (1979, p. 54)
104	BRX	Morin et al (1979, p. 55)
105	ROB	Morin et al (1979, p. 56)
106	DAWG	Morin et al (1979, p. 56)

107	PUB	Morin et al (1980, p. 29)
108	MICKEY	This Report
109	SPEC	This Report
110	SWEDE	This Report
111	GRAPS	This Report
112	TURK	This Report
113	WY	This Report
114	HOLLY	

UNEXPECTED
Archer, Cathro and Associates Limited

Uranium, Tin
116 B 2,3 and
115 O 14,15 (4)
(64°01'N,139°04'W)

References: D.I.A.N.D., (1981, p. 284); Green (1972); MacLean (1914, p. 124 - 125); Morin et al (1980, p. 28)

Claims: SURPRIZE 1-225

Source: Summary by K. Grapes from assessment report 090556 by A.R. Archer.

History:

The UNEXPECTED property was staked in 1976 following the discovery of anomalous uranium contents in the water of several creeks draining a Tertiary quartz porphyry stock. Uranium soil geochemical and ground radiometric surveys conducted from 1976 to 1978 located seven anomalies peripheral to, and within, the stock.

Description:

The claims are located 27 km east of Dawson on Australian Hill and access is via the Hunker Creek road.

The claims cover a Tertiary quartz-feldspar porphyry stock that intrudes metamorphic rocks of the Nasina Series (Unit A of Green, 1972): predominantly pale to dark green chlorite schist, black carbonaceous phyllite and minor marble. Anomalous uranium values include 400 ppm U in organic soil, 90 ppm U in leached schist and 48 ppm U in leached schist in drill core. Visible uranium mineralization has not been found.

Cassiterite found in nearby placer operations is presumed to be derived from the porphyry stock.

Current Work and Results:

Radon soil gas surveys were conducted on the western portion of the claim block and geological mapping, soil panning and ground radiometric scintillometer surveys were conducted on the northwestern side of the claims during the spring of 1979.

The radon survey located three additional anomalous zones over 1,000 counts per hour (cph). Background readings over the schist are approximately 300 cph and over the porphyry stock 600 cph. In total, ten anomalies were delineated, five of which are over 5,000 cph. The anomalies are controlled by faults and/or the contact between the stock and schist.

No anomalies were located as a result of the radiometric survey. Background readings are 60 counts per second (cps) over schist-gneiss and 150 cps over stocks in the Germaine and Alki Creek area.

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WOODCHOPPER
Archer, Cathro and Associates Limited; Teslin Joint Venture

Asbestos
116 B 5 (33)
(64°18'N,139°58'W)

Reference: D.I.A.N.D. (1981, p. 284, 293).

Claims: TOC 1-28

Source: Summary by K. Grapes from assessment report 090958 by J.S. Murray and R.J. Cathro.

History:

The TOC claims cover the Woodchopper asbestos prospect, first staked in 1963 and explored with a magnetic survey and bulldozer trenching in 1964 by Canadian Johns-Manville Company Limited. In 1978, Asbestos Corporation Limited performed a grid soil sampling survey west of the trenches. The property was staked by the Teslin Joint Venture (Cassiar Resources Limited, Brinco Mining Limited, Cominco Limited and Exploram Minerals Limited) in 1980-81.

Description:

The TOC property is situated on the south bank of the Yukon River, approximately midway between Dawson City and Clinton Creek.

Three small, highly-sheared, serpentinite bodies with occasional lenses of altered diorite occur on the claims. The surrounding rocks are mainly black graphitic argillite, graphitic schist and chlorite schist. Coarsely crystalline, tan dolomite outcrops south of the claims, and a thin quartz-feldspar porphyry dyke occurs to the east.

A small, intense northeast-trending aeromagnetic anomaly occurs between the two showings.

The main showing is located on the east side of the claims. It consists of chrysotile fibre up to 12 mm long occurring in black pods up to 5 m by 2 m, surrounded by highly sheared, fish-scale serpentinite.

The second showing occurs one km west of the trenched zone on the east bank of Woodchopper Creek. It is a small outcrop of jointed, unsheared serpentinite surrounded by highly sheared serpentinites. Joints are spaced two to 10 cm apart, and joint sets occur in at least three directions. Many of the joints are filled by white carbonate; a few contain cross fibre veins with chrysotile fibre up to 5 mm long. The outcrop grades less than 1% fibre.

Current Work and Results:

In 1981, the Teslin Joint Venture reanalyzed 490 samples collected by Cassiar Asbestos Corporation Limited in 1978. A new analytical technique which measures the length and quantity of fibres present in soils covering buried asbestos deposits was developed by Geotor Services Incorporated of Kamloops, B.C. Excavator pitting, detailed prospecting and geological mapping were also conducted in 1981.

Analyses of the soil samples showed that anomalous soils occur near the old trenches, over an area of about 300 m^2 to the north of the trenches, and over a poorly exposed ultramafitic body on the east bank of Woodchopper Creek, 1,400 m west of the trenches.

Excavator pitting of the anomalous areas showed that best soil values occur near black pod-type asbestos zones similar to the original showings but of poorer economic potential.

A black pod with fibre lengths up to 10 mm was uncovered by trenching at anomaly C on the west side of the property.

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STYX
Anaconda Canada
Exploration Limited

Lead, Copper, Zinc
Geochemical Target
116 B 6 (77)
(64°20'N,139°14'W)

References: D.I.A.N.D. (1981, p. 285-287); Green (1962).

Claims: STYX 1-160

Current Work and Results:

Four diamond drill holes totalling 373 m were drilled on the property. Drilling was difficult due to broken ground. No significant Pb-Zn-Cu sulphides were intersected.

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MARN
Mattagami Lake
Exploration Limited

Copper Skarn
116 B 7 (78)
(64°27'N,138°48'W)

References: D.I.A.N.D. (1981, p. 2, 284, 287-288, 293); Tempelman-Kluit (1970).

Claims: MARN 1-108

Source: Summary by K. Grapes from assessment reports 090847 and 090981 by J. Biczok and R. Kemp.

History:

The MARN claims are located 55 km north-northeast of Dawson City in the Tombstone Mountains.

The MARN 1-8 claims were staked in July, 1978, and 54 additional claims were staked late in the summer following initial work. In June, 1980 an additional 46 claims were staked.

Description:

The MARN claims cover the contact between a Cretaceous monzonite pluton and three east-dipping sedimentary units: Ordovician-Silurian Road River Formation, Permian Tahkandit Limestone and a schist of Jurassic age.

A green diopside and amphibolite skarn occurs in the limestone next to the contact with the monzonite pluton.

Current Work and Results:

Geological mapping, diamond drilling and geophysical and topographical surveys were conducted on the property in 1980.

I.P., magnetometer, RADEM and CRONE Shootback surveys were hampered by conductive overburden and permafrost.

The I.P. anomalies are related to graphite, pyrite and pyrrhotite concentrations in the schist and posssibly the Road River Formation. This survey has delineated the monzonite-schist contact to a depth of 200 m but does not indicate skarn mineralization.

The magnetometer survey indicated a northeast trend in the background data, roughly paralleling the stratigraphy, as well as northeast-trending anomalies. Two strongly positive anomalies (up to 1,149 gammas) occur crossing over into relatively negative lows (down to 113 gammas) in a background of 500 gammas.

The CRONE Shootback survey delineated two significant electromagnetic anomalies near strong magnetic anomalies.

Nine BQ diamond drill holes totalling 1,003.65 m were completed, of which two were abandoned. Only three of the holes intersected skarn.

Work on the MARN claims in 1981 consisted of geological mapping and 999.1 m of BQ diamond drilling in 17 holes. Seven of the drill holes were terminated due to poor drilling conditions and broken rods, and two holes were stopped short of the limestone target.

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PLUTO
Cominco Limited

Molybdenum
116 C 8 (80)
(64°20'N,140°21'W)

Reference: D.I.A.N.D. (1981, p. 283-284, 288-289).

Claims: PLUTO

Source: Summary by K. Grapes from assessment report 090916 by I.A. Paterson.

History:

The PLUTO showing was discovered in 1978 by stream sediment geochemical sampling. During 1979 a grid geochemical survey was carried out, and in 1980 trenches were cut one km north of the main quartz-feldspar porphyry stock.

Description:

The PLUTO showing, 54 km northwest of Dawson, is seven km north of the road to Clinton Creek and two km south of the Yukon River.

The claim group is underlain by Paleozoic(?) quartz mica schist (Green, 1972) which is intruded by a northeast-trending Late Cretaceous porphyry stock. Veinlets of quartz and sericite with molybdenite, wolframite and pyrite occur in the quartz porphyry plug.

Current Work and Results:

Five diamond drill holes totalling 815.3 m were drilled on the claims in 1981. Samples were taken over 1.5 m intervals in zones of mineralization and analyzed for Mo, W, Sn, Cu, Pb and Zn.

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RIKI	Unmineralized Target
Mattagami Lake Exploration Limited	116 B 9 (85)
	(64°30'N,138°24'W)

Reference: D.I.A.N.D. (1981, p. 284, 293).

Claims: RIKI 1-24

Source: Summary by K. Grapes from assessment report 090982 by J. Biczok.

History:

The claims were staked in 1980 to cover a copper-zinc stream sediment anomaly.

Description:

The RIKI claims are situated 71 km northeast of Dawson City and 8 km west of North Fork Pass (km 76) on the Dempster Highway.

Underlying the claims is an east-trending belt of Ordovician to Cretaceous, largely clastic, metasedimentary rocks, all intruded by small stocks of a Cretaceous syenite-monzonite suite.

Current Work and Results:

Geological mapping, stream sediment and rock geochemical sampling programs were conducted in 1981.

No visible mineralization was encountered.

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TAK	Unmineralized Target
Mattagami Lake Exploration Limited	116 B 10 (86)
	(64°32'N,138°32'W)

References: D.I.A.N.D. (1981, p. 284, 293); Green (1972).

Claims: TAK 1-48

Source: Summary by K. Grapes from assessment report 090980 by J. Biczok.

History:

The TAK claims were staked in July, 1980 to cover lead, zinc, silver and copper stream sediment anomalies found during detailed follow-up of GSC anomalies.

Description:

The property is located 69 km northeast of Dawson City and 13 km west of km 84 of the Dempster Highway.

The claims are underlain by an east-trending belt of Ordovician to Cretaceous clastic metasedimentary rocks. The clastic sequence consists of Precambrian(?) "Grit Unit" (Green, 1972) in thrust contact with the overlying Road River Formation chert, shale, slate and quartzite. These rocks, in turn, are overlain by chert pebble conglomerate and grey-black shale of the "Black Clastic" Formation and Jurassic clastic metasedimentary rocks of the "Lower Schist" sequence, all overlain by the Cretaceous Keno Hill Quartzite.

Diabase dykes and a complex series of porphyritic syenite-lamprophyre sills or dykes intrude the sequence.

Current Work and Results:

Geological mapping on a 1:10,000 scale and stream sediment, water and rock geochemical surveys were conducted during the 1981 field season. Four stream sediments and eight water samples were collected. Of the stream sediment samples taken, only one was slightly anomalous. Forty-nine rock samples were collected and analyzed for Cu, Pb, Zn, Ag, Mo, Au and U.

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KITL	Lead, Zinc
Umex	116 B 14, 15 (87)
	(64°49'N,139°00'W)

Reference: D.I.A.N.D. (1981, p. 293).

Claims: TS 1-16

Source: Summary by K. Grapes from assessment report 090855 by F. Felder.

Description:

The claims are located approximately 9.6 km west-northwest of Caldwell Lake on the Blackstone River. They are underlain by Cambro-Ordovician carbonates which are overlain by Siluro-Devonian graphitic carbonaceous shale, argillite, siltstone, minor limestone and Devonian chert and siliceous argillite. Mineralization occurs in narrow breccia zones in the Siluro-Devonian sedimentary rocks.

Current Work and Results:

A soil and rock geochemical survey as well as geological mapping was carried out in July, 1980. A total of 329 soil sample as well as 26 rock samples were analyzed for Cu, Pb, Zn and Ag. Thresholds defined in soils are copper 20 ppm; lead 65 ppm; zinc 120, 450 and 650 ppm; silver 0.5 and 1.2 ppm. Anomalous lead, zinc and silver coincide in an area of poor drainage. Near mineralized outcrop, soil samples analyzed gave values exceeding 1% Pb. Soil anomalies outline the northeast-trending mineralized breccias.

Rock grab samples gave values of up to 14,000 ppm Cu; 2,500 ppm Pb; 1.6% Zn; and 17.4 ppm Ag.

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GUCH
Springfield Consulting Limited — 116 C 2 (88) (64°04'N,140°43'W)

Reference: D.I.A.N.D. (1981, p. 293).

Claims: BE 1-31; JEM 1-8

Source: Summary by K. Grapes from assessment reports 090839 and 090901 by M.S. Cholach.

Description:

The BE and JEM claims were staked in 1980. The property lies approximately 64 km west of Dawson City and five km south of the junction of Yukon Highway 3 and the Sixtymile Road which passes through the central part of the claim area.

The claims are underlain by Tertiary andesite, basalt, shale, sandstone and conglomerate.

Current Work and Results:

Reconnaissance soil and rock geochemical sampling, mapping and trenching were conducted in 1980. Follow-up soil geochemical sampling was carried out in 1981.

A northwest-trending Pb-Zn anomalous zone was delineated. Assay values range up to 3,400 ppm Pb, 6.0 ppm Ag and 32 ppm Cu in soil samples. A sample of galena vein assayed 75.06% Pb.

Six trenches totalling 3,503.1 m^3 were excavated on the JEM claims in 1980.

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RAIL
Noranda Exploration Company Limited (N.P.L.) — Tungsten Skarn, 116 C 8 (90) (64°23'N,140°10'W)

Reference: D.I.A.N.D. (1981, p. 284, 292-293).

Claims: RAIL 1-214; ROAD 1-4; TRACK 1-28

Source: Summary by K. Grapes from assessment report 090843 by J.T. Walker and 090928 by K. Grapes and G. MacDonald.

History:

Between 1895 and 1908, part of the property along the Yukon River was investigated as a copper skarn. Little work was conducted between 1908 and 1979 when Noranda Exploration staked the RAIL and ROAD claims to cover stream sediment anomalies. Prospecting, geological mapping, geophysical and geochemical surveys and diamond drilling were conducted during 1979-80. Subsequent to the results of this work, more claims were added.

Description:

The claims, 56 km down the Yukon River from Dawson City, are accessible by boat. A medium- to coarse-grained granodiorite to biotite-quartz monzonite intrudes gently-dipping low-grade metasedimentary rocks of the Nasina Series as well as highly sheared metamorphic rocks of the Nisutlin Allochthonous Assemblage.

Garnet-diopside skarn, containing fine to coarse crystalline scheelite, is developed near the granodiorite contact.

Current Work and Results:

An airborne magnetometer and VLF survey was conducted in October, 1980 with follow-up ground geophysics during the summer of 1981. Geological mapping, soil, stream sediment and rock geochemical surveys were also carried out in 1981.

The airborne geophysical survey outlined several magnetic highs and lows not indicated on the G.S.C. aeromagnetic maps. VLF-EM outlined many east-striking anomalies. Ground magnetometer and VLF-EM surveys confirmed these anomalies. VLF-EM anomalies tend to occur in areas of anomalous copper, zinc and lead soil values. Magnetometer highs and lows occur in areas with anomalous soil values of lead and zinc. Both VLF-EM and magnetometer anomalies outline fine-grained mafic dykes, rhyolite intrusions and graphite schist.

Anomalous levels determined earlier as copper greater than 40 ppm, zinc greater than 100 ppm, lead greater than 35 ppm and tungsten greater than 5 ppm are still applicable. Areas of moderately anomalous tungsten soil values were extended by mapping and pan sampling.

The skarn assemblage can be subdivided into 1) garnet-diopside-epidote with accessory pyrrhotite, molybdenite, chalcopyrite, pyrite and scheelite; 2) diopside-quartz-calcite with accessory chalcopyrite, pyrrhotite and scheelite; and 3) diopside-biotite with accessory pyrrhotite, quartz and calcite.

The skarn occurs zoned around marble with assemblage 1 at the marble contact grading outwards into assemblage 2 and 3.

The granodiorite intrusive contains sporadic anomalous values of silver, lead and molybdenum with weaker values of copper and zinc.

In the southern portion of the property, fine-grained dykes are weakly anomalous in zinc, and rhyolite is slightly anomalous in lead.

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MICKEY
Cominco Limited — Lead Zinc Target, 116 C 8 (108) (64°19'N,140°28'W)

Claims: MICKEY 1-15

Source: Summary by K. Grapes from assessment report 090699 by E.G. Olfert.

Description:

The property is located 41.6 km northwest of Dawson City near the headwaters of Mickey Creek, accessible via the Clinton Creek Mine Road.

The claims are underlain by Nasina Series metasediments.

Current Work and Results:

A 1980 geochemical soil sampling program for lead and zinc disclosed an anomalous zone underlain by grey/

buff micaceous quartzite and gossan float. Soil samples containing greater than 100 ppm Pb and 150 ppm Zn were evaluated as anomalous.

Four trenches totalling 1,901 cu. m showed the anomalous zone to be northwest-trending and up to 200 m wide. Soil values range from 41 to 1,130 ppm Pb and from 47 to 800 ppm Zn. The anomalous lead values are coincident with the gossan float whereas anomalous zinc values are more widespread.

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1981 MINERAL CLAIMS STAKED

SPEC
M. Stutter
116 B 3 (109)
(64°00'N,139°07'W)

Claims 1981: SPEC (6)

WOODCHOPPER
Archer, Cathro and Associates Limited
116 B 5 (33)
(64°18'N,139°58'W)

Claims 1981: TOC (4)

TJOP
Archer, Cathro and Associates Limited; Teslin Joint Venture
116 B 5 (76)
(64°21'N,139°57'W)

Claims 1981: TJOP (4)

GRAPS
Cominco Limited
116 B 9 (111)
(64°40'N,138°04'W)

Claims 1981: GRAPS (61)

CALEY
Archer, Cathro and Associates Limited
116 C 8 (26)
(64°17'N,140°14'W)

Claims 1981: TIZA (76)

SWEDE
Cominco Limited
116 C 1 (110)
(64°11'N,140°25'W)

Claims 1981: SWEDE (24)

WY
G. Gutrath
116 C 2 (113)
(64°00'N,140°49'W)

Claims 1981: WY (3)

TURK
Archer, Cathro and Associates Limited
116 C 7 (112)
(64°29'N,140°47'W)

Claims 1981: TURK (96)

CLINTON CREEK, SPHERE
Archer, Cathro and Associates Limited
116 C 7 (15,17)
(64°26'N,140°45'W)

Claims 1981: TARTZHART (81); TATER (28); TOADSTEAK (75)

RG
W. Giesbrecht et al
116 C 7 (100)
(64°23'N,140°40'W)

Claims 1981: ROSE (20)

CONE HILL
Archer, Cathro and Associates Limited
116 C 7 (19)
(64°24'N,140°35'W)

Claims 1981: TEFATJV (2)

RAIL
Noranda Exploration Company Limited
116 C 8 (90)
(64°24'N,140°22'W)

Claims 1981: TIE (40)

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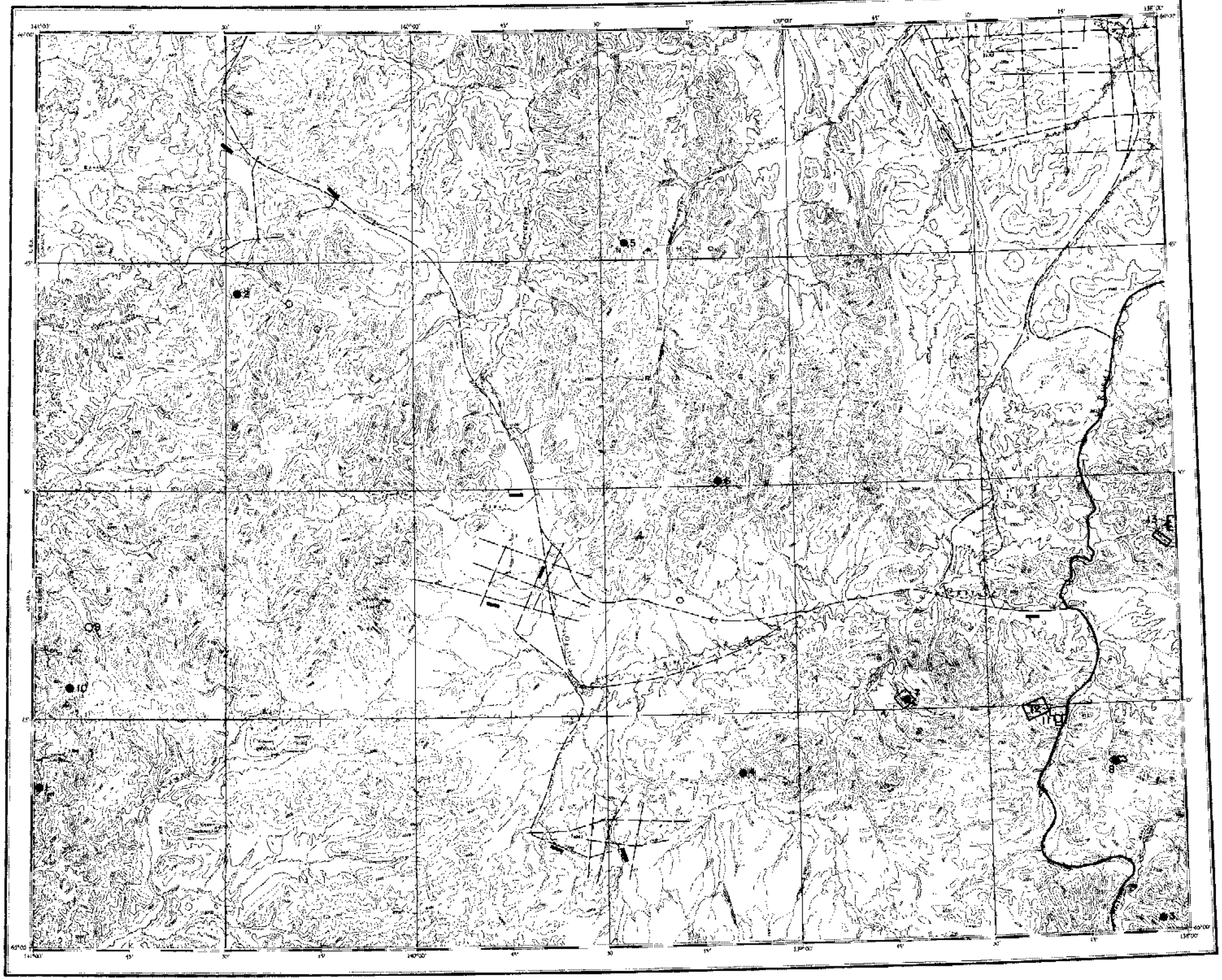
116 G&F



OGILVIE RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●61 .... Mineral Deposit or Occurrence see key on facing page

○72 .... Unmineralized Target

Mineral Claims in good standing (Jan 1982) and staked before Jan. 1981

Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL .... Coal Exploration Licence

CML .... Coal Mining Lease

...... Tote Trail

...... Driveable Road

...... Oil or Gas Well

...... Airstrip

OGILVIE MAP-AREA (NTS 116 F/G)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Open File 783 by: D.K. Norris, 1981.

NO.	PROPERTY NAME	REFERENCE
1	BURGOYNE	Cairnes (1914, p. 53, 112)
2	SIT DOWN	Norris (1976, p. 459)
3	DYKE	Norris (1974, p. 344)
4	NUCLEAR	Sinclair (1975, p. 77-78)
5	GIG	Lead Vein
6	COOT	Lead Vein
7	BIBLO	D.I.A.N.D. (1981, p. 295)
8	MILCH	This Report
9	PL	Morin et al (1980, p. 30-31)
10	TIN	Morin et al (1980, p. 30)
11	ELBOW	Morin et al (1980, p. 30)
12	KZ	This Report
13	BANG ON	This Report

MILCH
Jade Drilling Limited

Barite
116 G 1 (8)
(65°11'N,138°10'W)

Reference: D.I.A.N.D. (1981, p. 295).

Claims: KAREN 1-8

Source: Summary by G. Abbott from assessment report 090789 by B. Templeton.

Description:

The KAREN claims were staked in the summer of 1979 by Jade Drilling Limited and optioned to Millchem who explored in 1980 with hand trenching, sampling and 13 diamond drill holes totalling 452.6 m. Massive barite is exposed over an area about 80 m long and 20 m wide. Barite is either interbedded with, or is a vein within grey dolomite.

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1981 MINERAL CLAIMS STAKED

KZ
Mattagami Lake Exploration

116 G 1 (12)
(65°15'N,138°23'W)

Claims 1981: KZ (24)

BANG ON
Mattagami Lake Exploration

116 G 8,116 H 5(13)
(65°26'N, 138°02'W)

Claims 1981: BANG ON (22)

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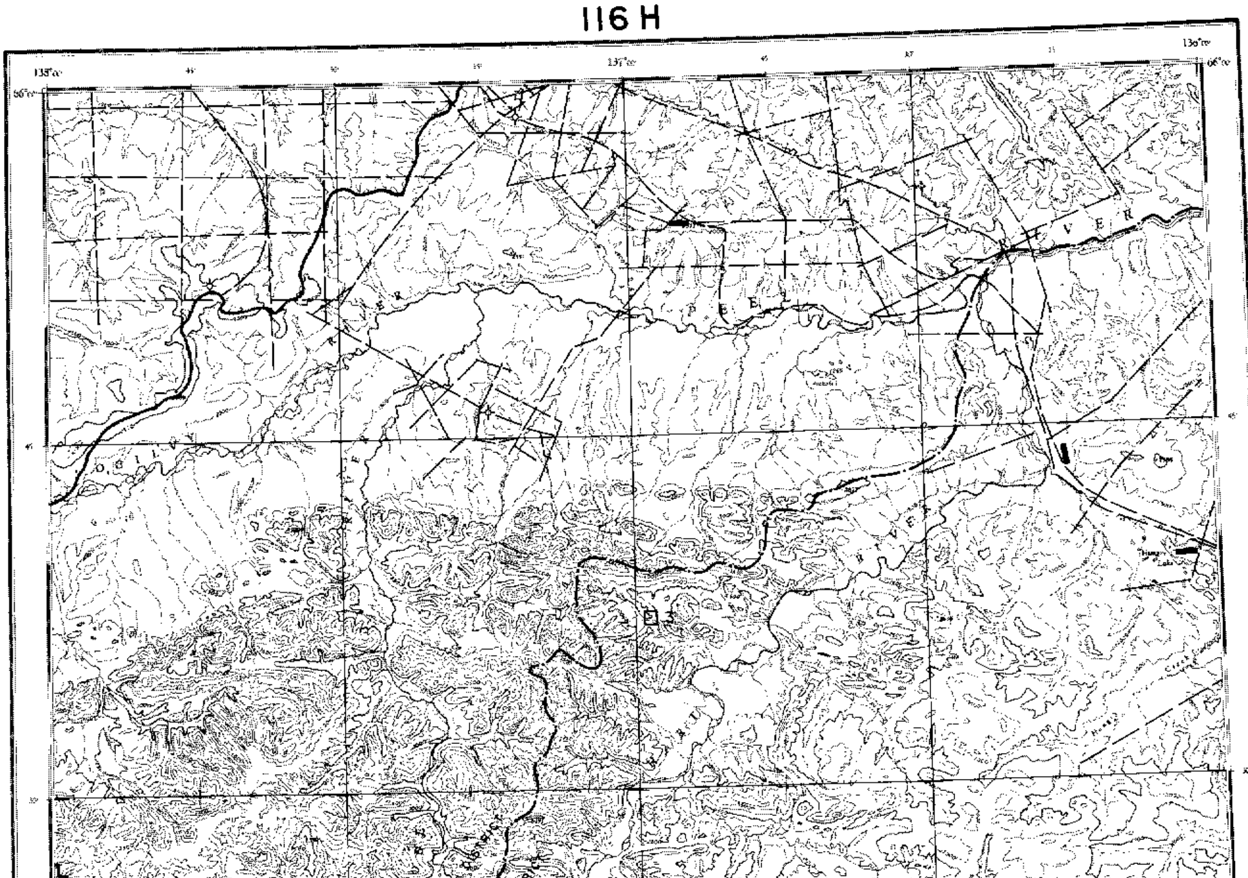
116 H



HART RIVER

YUKON TERRITORY

Kilometres 5 0 5 10 15 20 25 30 Kilometres

●[61] .... Mineral Deposit or Occurrence see key on facing page

○[72] .... Unmineralized Target

.... Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981

..... Mineral Claims staked in 1981

..... Prospecting Leases in good standing (April 1982)

..... Placer Claims in good standing (April 1982)

CEL........ Coal Exploration Licence

CML........ Coal Mining Lease

.... Tote Trail

..... Driveable Road

.... Oil or Gas Well

.... Airstrip

HART RIVER MAP-AREA (NTS 116 H)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.
GSC Open File 279 by: D.K. Norris, 1975.

NO.	PROPERTY NAME	REFERENCE
1	CUNG	Sinclair _et al_ (1975, p. 69-70)
2	JANE	Sinclair _et al_ (1975, p. 75); This Report
3	CYLINDER	Morin _et al_ (1980, p. 24)
4	HEIDI	This Report

1981 MINERAL CLAIMS STAKED

JANE
S. Wiecik
116 H 6 (2)
(65°17'N,137°15'W)

Claims 1981: WENDY (32)

HEIDI
K. Tomlinson
116 H 8 (4)
(65°16'N,136°04'W)

Claims 1981: HEIDI (4)

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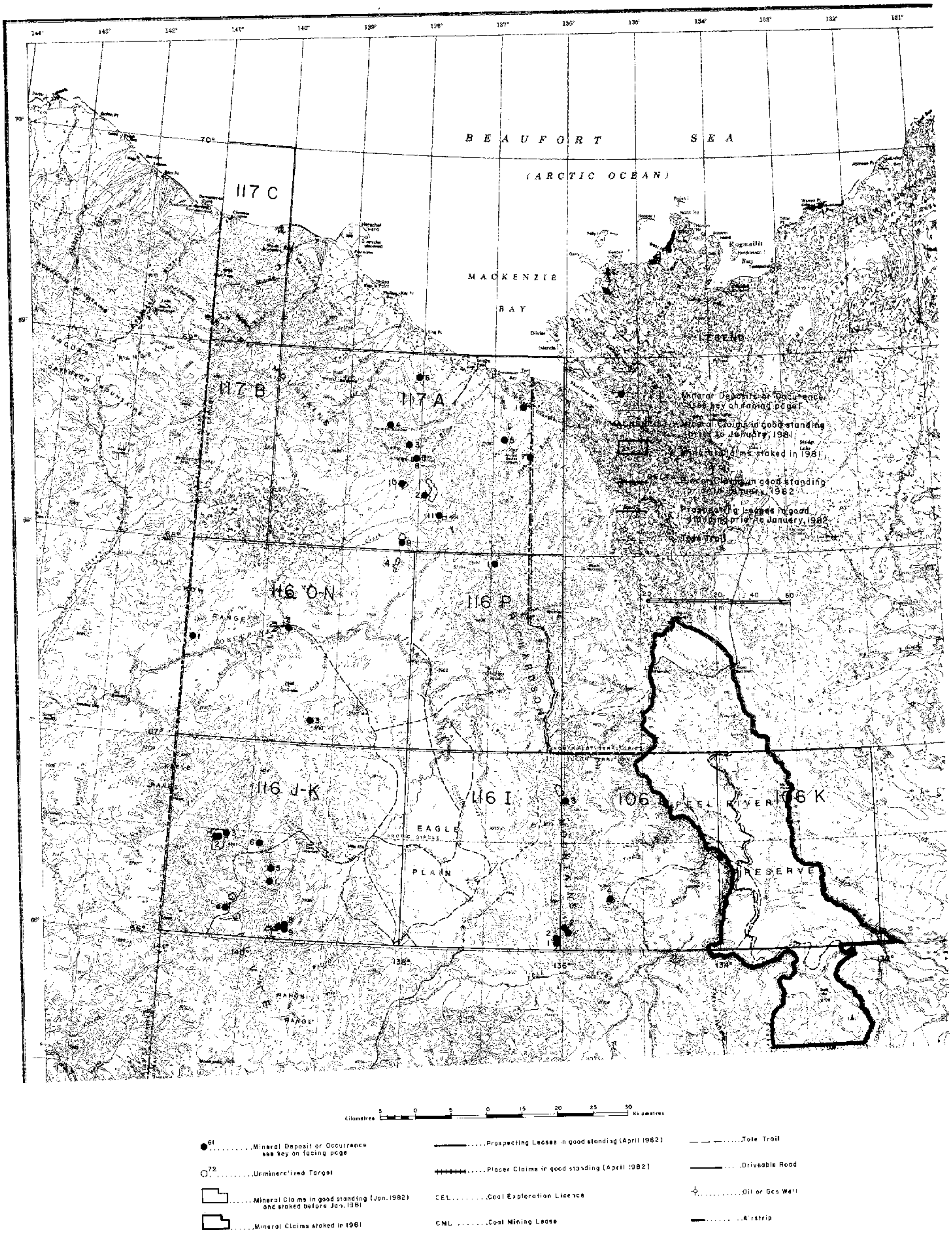
B E A U F O R T   S E A
(ARCTIC OCEAN)
MACKENZIE
BAY
117 C
117 B
117 A
116 O-N
116 P
116 J-K
116 I
106
106 K
EAGLE
PLAIN
PEEL RIVER
RESERVE
Kilometres 5 0 5 0 15 20 25 30 Kilometres
Mineral Deposit or Occurrence see key on facing page
Unmineralized Target
Mineral Claims in good standing (Jan. 1982) and staked before Jan. 1981
Mineral Claims staked in 1981
Prospecting Leases in good standing (April 1982)
Placer Claims in good standing (April 1982)
CEL Coal Exploration Licence
CML Coal Mining Lease
Tote Trail
Driveable Road
Oil or Gas Well
Airstrip

MARTIN HOUSE MAP-AREA (NTS 106 K)

General Reference: GSC Open File 715 by: D.K. Norris, 1980

NO.	PROPERTY NAME	REFERENCE
1	CARIBOU BORN	Coal

TRAIL RIVER MAP-AREA (NTS 106 L)

General Reference: GSC Open File 715 by: D.K. Norris, 1980

NO.	PROPERTY NAME	REFERENCE
1	PILON	Sinclair *et al* (1975, p. 88-89)
2	TWICE	Sinclair *et al* (1975, p. 90-91)
3	TOUCHE	This Report
4	NOR	D.I.A.N.D. (1981, p. 300-301)
5	RAS	Sinclair *et al* (1976, p. 78)
6	PETE	Sinclair *et al* (1976, p. 79)

EAGLE RIVER MAP-AREA (NTS 116 I)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	LLOD	Sinclair *et al* (1975, p. 87-88)
2	HARIVAL	Sinclair *et al* (1975, p. 87-88)
3	TOUCHE	This Report

PORCUPINE RIVER MAP-AREA (NTS 116 J-K)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	PEACH	Sinclair *et al* (1975, p. 81-82)
2	TERMUENDE	D.I.A.N.D. (1981, p. 301-304)
3	ALTO	Norris (1976, p. 461)
4	BERN	Sinclair *et al* (1975, p. 79-81)
5	FISHING BRANCH	Sinclair *et al* (1975, p. 81-82)
6	MOKO	Sinclair *et al* (1975, p. 81-82)
7	WART	Sinclair *et al* (1975, p. 84)
8	YUM	Sinclair *et al* (1975, p. 83-84)
9	BULLIS	Sinclair *et al* (1975, p. 85)

OLD CROW MAP-AREA (NTS 116 N-O)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	SUNAGHUN	Green & Godwin (1964, p. 18)
2	TACK	McConnell (1890, p. 127-128)
3	SALEKEN	Sinclair *et al* (1975, p. 85-86)
4	BEAR	

BELL RIVER MAP-AREA (NTS 116 P)

General Reference: GSC Open File 715 by: D.K. Norris, 1980.

NO.	PROPERTY NAME	REFERENCE
1	NORRIS	Norris (1974, p. 348)

BLOW RIVER MAP-AREA (NTS 117 A)

General Reference: GSC Open File 499 by: D.K. Norris, 1977.

NO.	PROPERTY NAME	REFERENCE
1	MOOSE CHANNEL	Bostock (1953, p. 30)
2	BONNET	Jeletsky (1960)
3	HOIDAHL	Vokes (1963)
4	WELCOME	Bostock (1953, p. 26)
5	RAPID	Young (1972, p. 232)
6	SHINGIE	Norris (1972, p. 97)
7	STRADDLE	Young (1972, p. 232)
8	MAM	D.I.A.N.D. (1981, p. 304)
9	NET	Morin et al (1979, p. 58)
10	BOU	Morin et al (1979, p. 58)
11	LIN	Morin et al (1980, p. 31)

TOUCHE
Mattagami Lake Exploration Limited

Barite
106 L 13,
116 I 16 (3)
(66°51'N,136°02'W)

References: D.I.A.N.D. (1979-80, p. 299-301); Norris (1979); Sinclair et al (1975, p. 91).

Claims: TOUCHE 1-56

Source: Summary by K. Grapes from assessment report 090925 by J. Biczok and P. Metcalfe and assessment report 090983 by J. Biczok.

History:

The TOUCHE claims were staked in July, 1980 to cover an outcrop of crystalline barite and stream sediment geochemical anomalies. Stream sediment geochemical sampling and prospecting programs were subsequently carried out.

Description:

The claims straddle Cornwall Creek, a tributary of the Rock River in the northern Richardson Mountains approximately 12 km east of the Dempster Highway and 500 km north of Dawson.

The property covers a major fault zone which separates Middle Cambrian clastics to the west from the Road River Formation to the east.

Current Work and Results:

In 1981, a 2.6 km grid was laid out and soil sampling, a Radem survey and geological mapping were carried out on a reconnaissance scale.

No further barite was discovered, though soil sampling outlined several anomalies. The Radem survey delineated one strong anomaly associated with a strong barite soil anomaly.

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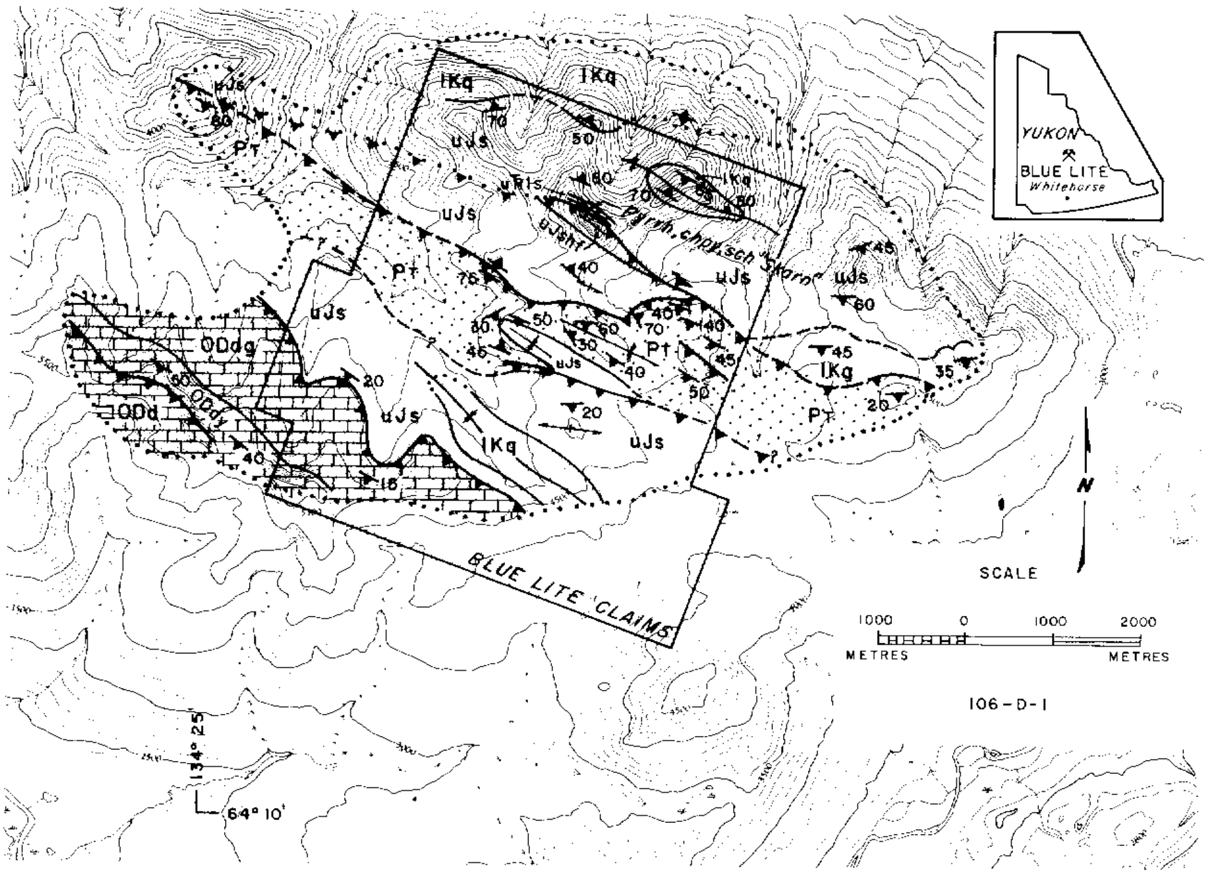
The following diagrams replace in full the figures indicated in the 1979-80 report.



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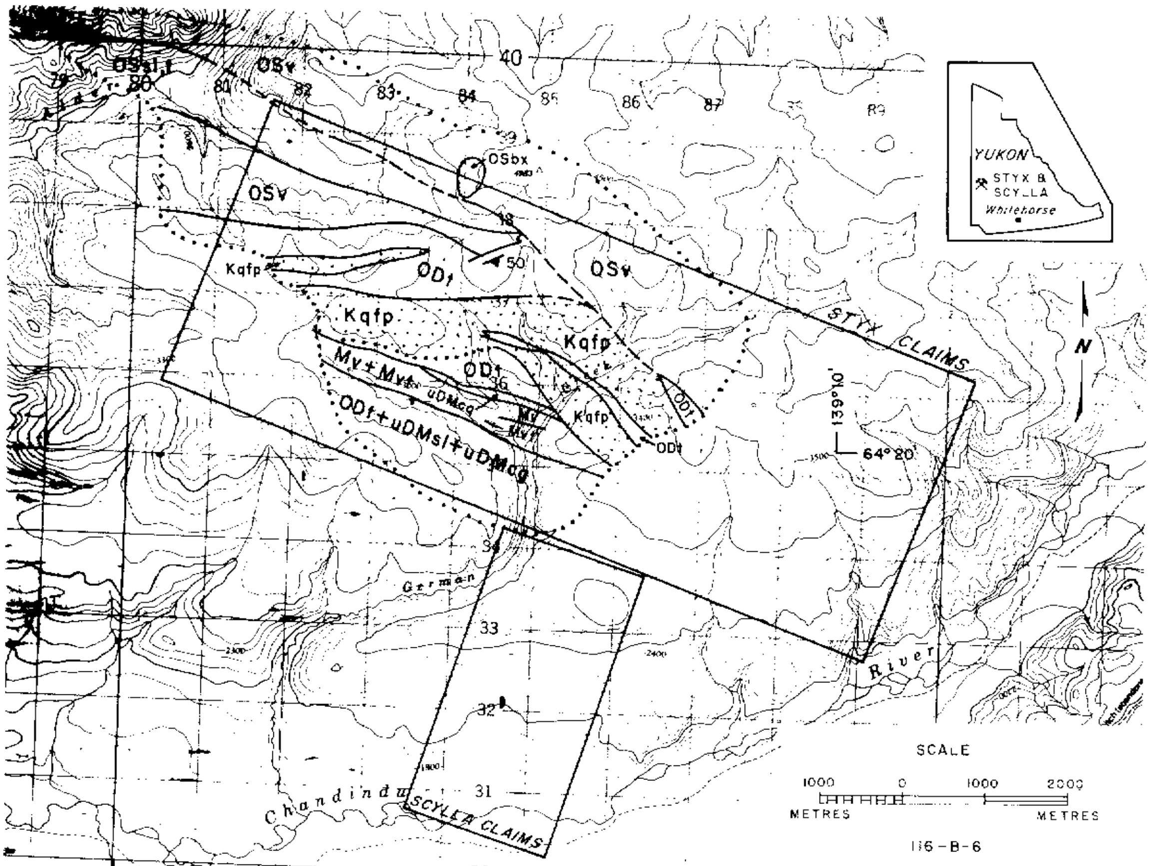

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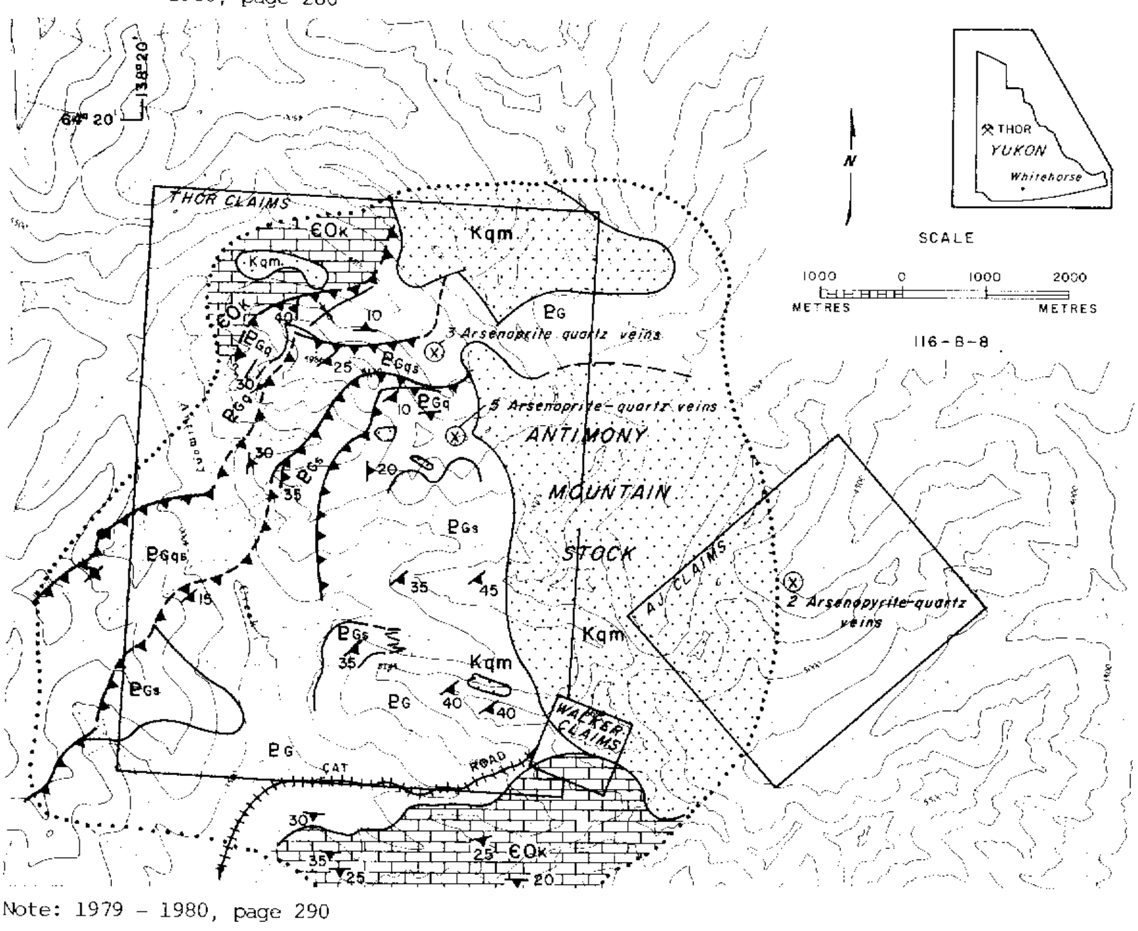

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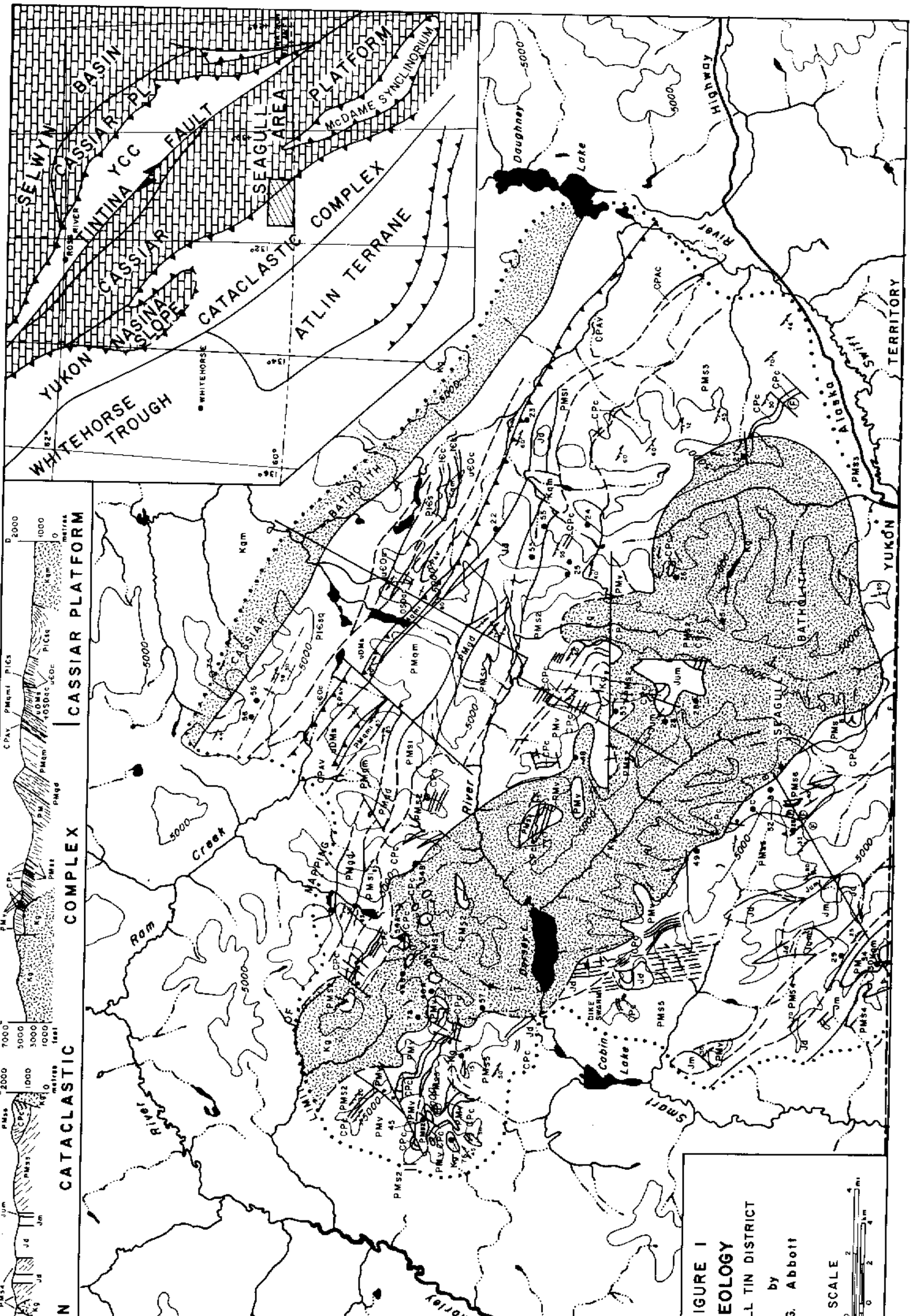

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