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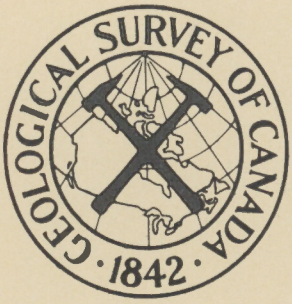

GEOLOGICAL
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DEPARTMENT OF ENERGY,
MINES AND RESOURCES

PAPER 70-70

MINERAL EXPLORATION AND MINING ACTIVITIES, MAINLAND NORTHWEST TERRITORIES, 1966 to 1968, (excluding the Coppermine River area)

R. I. Thorpe

Price, $2.00

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ABSTRACT

Summaries are given of 150 mineral exploration programs conducted on claims groups or larger areas in the mainland Northwest Territories during the period 1966 to 1968. Mineral exploration work in the Coppermine River area has been reported previously (Thorpe, 1970), and is excluded from this report. In addition, three exploration programs conducted on Victoria Island are described in this report; and development work, production, and exploration are also detailed for six producing and three developing mines.

The author has visited nearly half of the properties or exploration areas described in this report. However, the bulk of the information summarized here has been obtained from technical reports submitted by the various mining companies as representation work on their properties.

In 1966 exploration effort was concentrated in the Pine Point area where three additional, apparently economic, deposits of the Mississippi Valley-type were discovered. Aside from exploration for copper in the Coppermine River area in 1967 and 1968, exploration effort was directed toward uranium (Bear Province, Aphebian rocks in the East Arm of Great Slave Lake, Churchill Province south of the East Arm), silver (Bear Province near Great Bear Lake, northeast tip of Slave Province), copper-zinc and zinc-lead-silver-copper deposits of the massive sulphide type associated with volcanic rocks (southern and eastern parts of the Slave Province), lead-silver vein deposits (in Paleozoic rocks in the Mackenzie Mountains, and in northern Slave Province), copper deposits of the vein, disseminated and stockwork types (East Arm of Great Slave Lake), copper mineralization associated with "Giant" quartz veins (Bear Province), copper deposits of the Coppermine River-type (associated with continental basaltic lavas; Victoria Island, Bathurst Inlet), and a number of known gold properties were reinvestigated (Slave Province). In addition some exploration work was done on nickel arsenide prospects, a vein barite property, tantalum-bearing pegmatites, a copper-tungsten prospect, some copper-cobalt veins, a cobalt-bismuth prospect, and an alkaline complex. Gold, copper and uranium possibilities were investigated in Keewatin District. Some reconnaissance work was done in 1968 to assess the nickel potential of the boundary between the Slave and Churchill structural provinces.

EXPLORATION AND MINING 1966 to 1968, MAINLAND NORTHWEST TERRITORIES (excluding the Coppermine River area)

INTRODUCTION

This report is a summary of the exploration activities in the Mackenzie and Keewatin Districts of the Northwest Territories, with the exception of the Coppermine River area which is being treated in a separate report. Brief notes are included on exploration efforts on Victoria Island, District of Franklin, but other activities in the Arctic Archipelago have been omitted. It is also to be noted that in the case of the Pine Point area, where extensive exploration was carried out in 1965 and 1966 for lead-zinc deposits, only those properties are described for which the exploration efforts met with some success. Developments and production by the operating mines are described in the report.

Exploration activities in Mackenzie District prior to 1947, and through 1949 in some instances, have been described by Lord (1951). Exploration activities and mine developments for the period 1954 through 1959 have been reported by McGlynn (in press). Annual reports dealing with these subjects were prepared for the years 1960 through 1965 (Baragar, 1961; Baragar, 1962; Baragar and Hornbrook, 1963; Schiller and Hornbrook, 1964; Schiller, 1965; and Thorpe, 1966).

Exploration activity in the Northwest Territories in 1966 was concentrated in the Pine Point area where exploration for lead-zinc deposits was based largely on the induced polarization method of geophysical surveying, and was successful in a few cases. In 1966 copper showings in the Coppermine River area were reinvestigated and extensive staking was undertaken. In 1967 and 1968 exploration effort was concentrated in the Coppermine River area (Thorpe, 1970). Other exploration in 1967 was directed toward the search for uranium, copper-zinc, copper, lead-silver, gold, and silver deposits. Somewhat more emphasis was placed on exploration for uranium and silver in 1968, and exploration for nickel was started along the boundary between the Slave and Churchill structural provinces.

Visits were made by the author to nearly half of the properties or exploration areas described in this report. Efforts were made, of course, to visit the most significant showings that were discovered or were undergoing re-evaluation. For those properties not visited by the author, and for much of the information regarding properties that were visited, the technical reports submitted by the various companies as Representation Work on their claim groups have been relied upon heavily and thus, the accounts of properties and exploration programs are dependent on the quality and accuracy of these reports. For this reason the descriptions of the properties and showings are of variable quality. In addition, the author has no doubt, inadvertently or by misinterpretation, introduced errors that were not present in his sources of information.

Original manuscript submitted: April 28, 1970.
Final version approved for publication: December 29, 1970.

Since much of the information summarized here has been derived from reports submitted as Representation Work, this report may serve as some indication of the information available from this source. Such reports are kept on file and may be examined or copies obtained, following a three-year confidential period, at the Yellowknife or Ottawa offices of the Department of Indian Affairs and Northern Development.

The latitudes and longitudes that are given in the headings of the property descriptions are, in most cases, for the approximate centres of the groups of claims. In a few cases the locations are for the principal showing on the property. A listing of the properties described according to the National Topographic System is given at the back of the report.

PINE POINT AREA

Extensive staking in the area started in 1965 and continued in 1966. The staking completely surrounded the property of Pine Point Mines and then expanded to cover most of the area between the Little Buffalo and Buffalo Rivers and extending south from the shore of Great Slave Lake to the boundary of Wood Buffalo Park. A total of about 30,000 claims were staked in the area by a great number of mining companies. The area is low and flat and is underlain by dolomite, and associated sediments, of lower Middle Devonian age (Norris, 1965). Rock exposure is negligible in the area and exploration was dependent on geophysical methods. The induced polarization method was found to be the most highly successful technique in the area.

A great number of properties were investigated in the Pine Point area by induced polarization surveys with negative results. However, on a number of properties weak to moderate chargeability anomalies were obtained which gave negative results when tested by drilling. In particular, the induced polarization surveys were apparently not capable of detecting lead-zinc deposits of the Pine Point type at much below 200 feet in depth. The favourable Presqu'ile Formation could thus only be explored westward to near the Buffalo River by induced polarization techniques. Some successful exploration programs in the area are summarized in the following descriptions.

Buffalo River Exploration Ltd. (TV 1-158 claims)
(85-B-15, 16; about 60°50'N, 114°28'W) (Zinc, Lead)

This company is held 46 per cent by Newconex Holdings Ltd. and 50 per cent by Conwest Exploration Company Ltd. and Central Patricia Gold Mines Ltd. A total of 569 claims were investigated by induced polarization surveys in the general Pine Point area in 1965 (Thorpe, 1966, p. 32). This work was done by Huntec Ltd. as part of a joint exploration program by Newconex-Conwest.

One of the best induced polarization anomalies located in this survey was on claim TV 113 at approximately 60°52'N and 114°31'W. This anomaly had a peak chargeability of 4.9 milliseconds, and was 700 feet long and 300 feet wide within the 3 millisecond contour.

When this property was visited about May 20, 1966, hole No. 408-4 was being drilled on claim TV 113, which forms the northwest corner of the TV group. Hole 408-1 was drilled at the centre of the best anomaly that was

obtained on the property, and intersected ore grading 6.6% Pb and 19.8% Zn for 26 1/2 feet starting at a depth of 159 feet. Due to drilling difficulties, this first hole was bottomed in very good mineralization. Hole 408-3 was drilled about 200 feet west of 408-1 and gave an intersection of 51 feet starting at a depth of 218 feet which graded 3.5% Pb and 10% Zn. Sulphide minerals were most concentrated from 218 to 231 feet, and in particular in the sections 218 to 221 1/2 feet and 228 to 231 feet. Hole 408-4 was located about 100 feet south of 408-1 and failed to indicate any ore.

By September drilling had resulted in determining the presence of 1,250,000 tons of ore grading 13% combined lead-zinc (The Northern Miner, Sept. 22, 1966). The deposit was found to be very complex structurally; apparently the deposit was emplaced along a fault or has been complicated by post-mineralization faulting. A later estimate of tons of ore contained in the deposit was 1,350,000 tons grading 9.6% Zn and 3.4% Pb. At the end of 1968 reserves of 1,400,000 tons grading 13% combined lead-zinc were reported and the possibility of bringing the property into production was being considered.

The results of drilling done on the main anomaly during 1966 are listed below. Some additional diamond drilling was planned for the 1969 season.

Some study of the feasibility of developing the deposit, in conjunction with development by Coronet Mines of its two deposits in the same area, has been done. However, no development plans have been announced.

Coronet Mines Ltd. (85-B-10, 15;
approximately 60°45'N, 113°35'W) (Lead, Zinc)

An induced polarization survey was carried out on this property during the summer of 1966. This survey had been completed by mid-August and resulted in three anomalies of interest. Two of these, one of which overlapped onto the property of Pine Point Mines, gave responses of about 6 milliseconds. The third and largest of the anomalies (C-2) was about 1,000 feet north-south by 800 feet east-west and gave a 16 millisecond response. This anomaly also extended to the north onto the property of Pine Point Mines. The main part of the anomaly occupied an area 300 by 600 feet. Drilling on the property in late August, 1966, intersected lead-zinc mineralization.

By October, 1966, the drilling had indicated that two of the anomalies represented sulphide mineralization. A minimum of 300,000 tons of ore grading 10% combined lead-zinc had been indicated for the C-3 anomaly, while drilling on the C-2 anomaly had outlined 314,000 tons grading 15% combined lead-zinc. A total of 56 holes had been drilled by the end of 1966 or early in 1967 and these indicated reserves of 1,100,000 tons grading 13.2% combined lead-zinc.

Late in 1967 some of the claims of the Coronet property lapsed. Claims were staked by other interests covering at least one of the deposits. These claims were sold back to the company for an estimated $250,000.

The feasibility of bringing the property into production was under investigation in 1968. A joint operation with Conwest-Newconex, including the deposit of similar proven tonnage held by these companies, was one of the possibilities under consideration. Further diamond drilling was planned for 1969 in an attempt to increase the proven reserves.

Hole no.	Approximate location relative to hole 408-1 Latitude	Departure	Depth (ft)	Intersection	Core length (ft)	Pb(%)	Zn(%)
408-1	0	0	185 1/2				
408-1A	5S	15W	354	155' -289 1/2'	134 1/2	2.94	9.83
408-2	0	270E	252	139' -179'	40	0.36	0.43
				(147' -167')	20	0.57	0.60
408-3	0	230W	297	55' -113'	58	0.39	2.90
				113' -218'	105	Low grade	
				218' -283'	65	3.49	11.67
408-4	150S	0	370				
408-5	140N	0	300	84' -89 1/2'	5 1/2	0.87	5.35
				112' -168'	56	0.28	1.17
408-6	0	140E	354	247 1/2' -282 1/2'	35	0.36	2.44
408-7	70S	350W	320	55' -88 1/2'	33 1/2	1.42	4.86
408-8	0	132W	400	100 1/2' -115'	14 1/2	0.12	2.88
				127 1/2' -355'	227 1/2	4.61	12.90
408-9	70N	210W	407	55' -151 1/2'	96 1/2	1.26	4.50
				210 1/2' -388'	172 1/2	5.52	11.15
408-10	70S	210W	410	81 1/2' -348 1/2'	267	4.19	12.01
408-11	70N	70W	389	161' -338'	177	3.01	7.78
408-12A	70S	70W	360	129 1/2' -172 1/2'	43	0.29	4.12
				172 1/2' -222 1/2'	50	Low grade	
				222 1/2' -301'	78 1/2	1.64	6.11
408-13	70N	70E	362	66' -108'	42	0.48	2.83
				168' -193'	25	0.63	5.57
				275' -308'	33	5.00	9.86
408-14	70S	70E	350	136 1/2' -140'	3 1/2	0.78	11.61
				193' -195'	2	Moderate grade	
408-15	70N	340W	342				
408-16	220N	210W	384				
408-17	140N	135W	312 1/2	268 1/2' -305'	36 1/2	1.29	8.23
408-18	140N	270W	347				
408-19	150S	140W	356	130' -140'	10	Low grade	
				157' -168 1/2'	11 1/2	1.08	8.35
				180' -183'	3	0.34	6.21
				199 1/2' -202'	2 1/2	0.29	10.57
				244 1/2' -290'	45 1/2	3.53	8.67
				328' -330'	2	7.38	16.34
408-20	150S	280W	271				

Yellowknife Base Metals (LE and AA claims)
(85-B-15; about 60°50'N, 114°46'W) (Lead, Zinc)

This property is in the Pine Point area and lies immediately north of the property of Pine Point Mines. Yellowknife Base Metals is a wholly-owned subsidiary of Consolidated Manitoba Mines.

An induced polarization survey was conducted on the property by Huntec Ltd. during the 1967 season. This survey outlined a large anomaly 4,000 feet long by 2,400 feet wide. The broad anomaly extends south onto the property of Pine Point Mines, with one of the best peaks located on the boundary, and also east onto the property of New Park Mining. Induced polarization surveys carried out by Pine Point Mines on their property had apparently only extended west to within 1/2 mile of the anomaly.

The induced polarization survey was conducted along north-south lines spaced 800 feet apart and an electrode separation of 400 feet was used. The survey totalled 25 miles and covered claims LE 1-9, AA 44, 45, 52-55, 59-61, 63-65, 71, 75-86, 91-108, LA 1, and GCC 1-3. More detailed surveying was done on claims AA 106, 107 and 108.

It was reported to the author on September 26, 1967, that the first hole on the anomaly had intersected 25 feet of lead-zinc mineralization. It was later reported that succeeding holes also showed some mineralization (The Northern Miner, Nov. 2, 1967, p. 2).

Hole No. 1 was drilled to a depth of 659 feet and intersected sulphide mineralization at a depth of 220 feet and in two other sections at greater depth. Hole No. 2 was located 900 feet to the west. By the end of October, 1967, five holes had been completed on the property but none of the sulphide-bearing intersections were regarded as of ore grade (The Northern Miner, Nov. 2, 1967, p. 2). Early in 1968 a gravity survey was conducted on the property and resulted in outlining an anomaly 350 by 800 feet within the broad induced polarization anomaly. A test hole intersected good sulphide mineralization and another drill was subsequently put in operation. Seven out of nine holes within the gravity anomaly gave good intersections, some of which are listed below.

Hole no.	Location relative to Hole no. 28	Intersection	Core length (ft)	Zn(%)	Pb(%)
17	115 ft NE	230' -248 1/2'	18.5	7.69	combined
28	-	255' -275'	20	21.14	9.65
30	250 ft N		20	3.15	0.47
31	250 ft W	234' -241'	7	22.25	8.21
33	50 ft S	261' -271'	10	11.07	5.23
34		251' -271'	20	17.97	2.01

Drilling on the property was suspended during the summer of 1968. The company acquired an option on the property of New Park Mining Company to the east, in part because the gravity anomaly extended onto this property. Yellowknife Base Metals could earn an interest up to 49 per cent in the New Park property through carrying out specific exploration work over a 5-year period. Two test holes were drilled on the New Park property and then, in September, drilling was resumed on the AA claims in an attempt to extend the

known area of mineralization. By the end of October, 1968, an additional 12 holes had been drilled on the property. Four of the first nine holes gave good-grade intersections as follows:

Hole No.	Intersection	Core length (ft)	Zn(%)	Pb(%)
39	(250'-255')	5	18.75	3.26
	250'-260'	10	9.66	1.64
42	227'-237'	10	6.25	1.42
44	231'-243'	12	31.61	10.61
47	230'-235 1/2'	5.5	12.15	2.88

Drilling on the property to the end of 1968 was reported to have totalled over 24, 900 feet and to have indicated an estimated 338, 125 tons averaging 6% Zn and 1.73% Pb (Canadian Mines Handbook 1969-1970, The Northern Miner Press Ltd.). Further drilling was planned on the property in 1969.

GENERAL AREA OF EAST ARM, GREAT SLAVE LAKE

Exploration in this area was mainly for copper and uranium deposits. Some interesting showings were located but none was shown to have economic potential. A showing of barite, some copper-cobalt veins, and three niccolite properties were also investigated during the three-year period. In addition, a Cu-Pb-Zn-Ag property at Salkeld Lake and a Zn-Pb-Ag-Cu deposit at Indian Mountain Lake were reinvestigated.

Samson Mines Ltd. (ANDREA 1-18 claims)
(75-D-7; about 60°16'N, 110°56'W) (Uranium)

This property is on the southeast side of Pilot Lake in the general Fort Smith area. A preliminary examination of the property was made by A. P. Fawley, consulting engineer early in the 1968 season. Some pits and trenches had been excavated on the property more than 10 years earlier. Bands of paragneiss are interlayed with intrusive granitic rocks. Medium- to coarse-grained, pink, porphyritic and slightly gneissic, granite is reported to be the predominant rock exposed around the south part of Pilot Lake.

Two old pits on the southeast side of the lake were found to be moderately radioactive over widths of a few feet. Samples from these assayed 0.325% U_3O_8 and 0.04% U_3O_8. Radioactive readings of greater than six times background were obtained at scattered localities for several miles along the south shore of Pilot Lake. The pink porphyritic granite here contains streaks of grey gneiss. A sample from an old pit assayed 0.01% U_3O_8, and a sample of similar rock from about 1/2 mile to the northeast assayed 0.015% U_3O_8.

A scintillometer survey along grid lines spaced 400 feet apart was recommended for the property.

San Doh Mines Ltd. (FRED 1-29 claims)
(75-E-5; about 61°28'15"N, 111°59'15"W) (Copper, Zinc)

This property, on Thubun Lake, was optioned by the company from F. Lypka of Yellowknife. The company conducted a small drilling program, consisting of 5 short holes, on the property in 1966. The assay results from the drilling were reported to have given values up to 3.21% Cu, with some silver, lead and zinc (The Northern Miner, Mar. 2, 1967, p. 3). An electromagnetic survey was carried out on lines spaced at 500-foot intervals.

The drilling program totalled 671 feet and was carried out from October 19 to November 18. The locations of these drillholes are given in the following table. The grid lines are oriented north-south and east-west and the grid origin is at the mutual corner of claims 1, 2, 10 and 11 on the east tip of an island. The holes were drilled on the mainland about 1,600 feet west of the island.

Hole No.	Latitude	Departure	Azimuth	Inclination	Depth (ft)
66-1	6 + 00N	35 + 00W	075°	45°	105
66-2	6 + 00N	35 + 00W	020°	45°	151
66-3	5 + 20N	34 + 00W	035°	38°	163
66-4					147
66-5	4 + 60N	33 + 00W	035°	40°	105

The holes were disappointing in that they intersected only very erratic mineralization. Assay values for zinc, copper and silver were generally very low. The best zinc assay was 7.23% across 3 feet and other samples assayed 1.80% or less. One copper value of 3.21% across 5 feet was obtained, with 1.50 oz./ton silver, and other assays were 1.03% Cu or less.

The property was visited by H. C. B. Leitch, consulting geologist, December 14 to 19, 1966. He recommended that a program of prospecting and geological mapping be conducted and recommended drilling of five additional holes.

Prior to breakup in the Spring of 1967 a second drilling program was carried out on the property. This program was assisted by the Federal Government through the Northern Mineral Exploration Assistance Program. The first drillhole in this program was inclined at 35 degrees and gave an intersection of 26 feet which assayed 0.367% Cu, 3.5% Zn and 0.6 oz./ton Ag (The Northern Miner, Mar. 9, 1967, p. 13).

The 1967 drilling consisted of 2,668 feet in 17 holes. The drilling was done February 21 to May 2, except for the last hole which was drilled June 27-30. Fourteen of the holes were drilled from the ice of the lake. Data concerning these holes are listed in the table below. The property was visited by the author July 18, 1967.

Hole 67-1 gave, as noted above, a fairly zinc-rich intersection of 26 feet between 58 and 88 feet in the hole. Other assay results from this drilling confirmed the generally low and erratic values obtained in the earlier program. The core was assayed for Zn, Cu, Ag, Pb and Bi and the best results for these metals were 5.0% Zn/4 ft., 1.40% Cu/4 ft., 1.80 oz./ton Ag across 7 feet, 7.2% Pb/6.5 ft., and 0.70% Bi/3 ft.

Hole No.	Latitude	Departure	Azimuth	Inclination	Depth (ft.)
67-1	00+190N	300+33W	0°	35°	198
-2	00+190N	300+33W	0°	60°	132
-3	00+190N	300+33W	0°	vertical	198
-4	80+ 00N	350+80W	280°	30°	98
-5	80+ 00N	350+80W	30°	45°	124
-6	00+100S	100+43W	10°	45°	160
-7A	00+100S	100+43W	330°	45°	18
-7B	00+100S	100+43W	330°	48°	158
-8	60+160N	80+190W	345°	30°	124
-9	60+160N	80+190W	345°	60°	73
-10	60+156N	100+ 10W	15°	30°	108
-11	60+156N	100+ 10W	15°	55°	157
-12	00+120S	230+ 00W	0°	60°	216
-13	00+ 40S	230+ 00W	0°	45°	180
-14	20+ 00S	230+ 00W	0°	60°	320
-15	00+120S	200+150W	0°	60°	210
-16	00+116S	100+154W	10°	45°	89
-17	120+ 00S	120+ 00W	337°	45°	123

Precambrian metasediments consisting of biotite-bearing pelitic schists, quartzofeldspathic gneiss, and garnetiferous gneiss are present on the property. These rocks are intruded by a mass of granite, possibly a stock, and by granite and pegmatite dykes. The mineralized zones consist of irregular quartz veins. These veins are reported to be very much disrupted by post-mineralization faulting. The fault zones are the sites of extensive silicification and, in part, consist of irregular breccia zones.

The Island Vein is located at about 61° 28'45" N and 111° 58'50"W and consists of a well-mineralized quartz vein with a strike of N 50°W and a dip of 73° SW. This vein was tested by holes No. 6, 7B and 16.

The No. 3 vein is located on the mainland at the shore of Thubun Lake at about 61° 28'53" N and 111° 59' W. The Main Vein is located on the shore about 2,200 feet to the west at about 61° 28'55" N and 111° 59'50" W. These two veins are shown on a map by Irwin and Prusti (1955).

An electromagnetic survey conducted on the property by Giant Yellowknife Mines in 1958 outlined one main anomaly beneath the lake. Holes 12 and 15 were drilled to test this anomaly. Hole 67-12 intersected a quartz vein containing some mineralization at 172 to 180 feet. Some graphite was also evident in the core. These holes failed to indicate mineralization of economic interest.

The mineralization indicated by the drill program was considered to be too erratic in distribution to warrant further investigation. It was recommended that the option be dropped.

Rolling Hills Copper Mines Ltd. (BUN 1-99, 104-121, 131-137, 146-157 claims) (75-E-12; about 61° 32'45"N, 111° 47'30"W) (Copper)

This property in the Thubun Lakes area was optioned from First Northern Exploration late in 1965. The property has been described previously by Baragar and Hornbrook (1963, p. 22) and by Thorpe (1966, p. 29).

In January 1966 Rolling Hills Copper Mines was suspended from trading on the Vancouver Stock Exchange in connection with a drill program on the property. The core from the first hole was transported to Vancouver under guard and the assays were reported to have indicated "non-commercial grades". One drillhole was completed in January and drilling was being continued.

By mid-March 5 holes had been completed on the property. Two of these holes were to a depth of about 270 feet. These holes were essentially drilled from one location, so that no information was obtained along the strike of the formations. Drilling was suspended for a time while line-cutting was being done in preparation for geophysical surveys.

The first two holes, of which one was steep, were drilled from the lake near the main showing. A fan of three shallow holes was then drilled from a site 50 feet south, just at the shore of the lake. Part of the core from four of the holes was logged by the author during a visit to the property early in March. The shallow holes entered a band of medium-grained marble and very coarse-grained diopside skarn, about 40 feet in width, a short distance from their collars. Narrow bands in the marble and skarn contain minor iron-rich sphalerite and very minor galena. Some bornite is present in the coarse diopside rock, especially along cleavage cracks. One intersection of 4 1/2 feet contained disseminated bornite. Some chalcopyrite, and rarely pyrrhotite, are present in the core, chiefly in siliceous metagreywacke. Biotite-rich greywacke is the principal sedimentary rock. Narrow pegmatite dykes cut the sediments and one dyke along the lower contact of the main skarn band may be fairly persistent.

Magnetic and electromagnetic surveys were completed on the property prior to spring break-up. These surveys were conducted by Sulmac Exploration Services between mid-February and May 7. The electromagnetic survey covered 182 line miles and outlined a number of anomalies, including three that were relatively strong.

Tremar Minerals Ltd. (ZN 1-24 claims)
(85-H-9; about 61° 30'25"N, 112° 23'35"W) (Zinc)

These claims are located on Lake-of-the-Rock about 6 miles southeast of Great Slave Lake. The main showing on the property was formerly covered by the GO 1-12 group of claims.

The property was optioned by the company from Mrs. Mary M. Woolgar of Yellowknife. Three holes totalling 200 feet were drilled on the property in March and April, 1966, apparently from the ice on the lake. These holes were reported to have intersected quartz-feldspar porphyry, porphyritic granodiorite; quartz-mica schist, minor hornblende schist, and quartz veins. Very minor pyrite and sphalerite were reported in the core.

The main showing on the property is near the boundary of claims ZN 4 and 5 on the north shore of Lake-of-the-Rock. Massive and disseminated sphalerite, and minor pyrite, are present in a strong fracture-shear zone striking S80° E. The shear zone has a known length of 375 feet. Massive sphalerite is present over an area 5 feet by 5 feet and disseminated sphalerite extends along the shear zone for at least 20 feet.

Bevco Mines Ltd. (BEV 1-114, 116-127, CB1-15, 17-49, BELL 2 and GONE 8-57 claims) (85-H-7, 8, 9, 10; about 61° 27'N, 112° 30'W) (Copper)

This property is located on Great Slave Lake near the mouth of Thubun River. Some trenching was done on the 225-claim group by Nor-Can Minerals during the 1967 season. Samples from the BEV and CB claims were reported (The Northern Miner, Nov. 2, 1967, p. 11) to have assayed 0.5 to 5% Cu, 0.05 to 0.10% Mo, and 0.2 to 0.5 oz./ton Ag. Bevco Mines acquired 162 of the claims prior to the 1968 season. The following description of the geology and exploration activities has been summarized from company reports.

Klyceptor Surveys Ltd. flew a geoelectromagnetic survey over the property March 4 to June 10, 1968. This survey was flown by helicopter at an elevation of about 300 feet along 113 north-south flight lines spaced, generally, at 500-foot intervals. The survey covered 234 line miles and about 70 anomalies were obtained. The strongest anomalies within the surveyed area are grouped on the southern part and north of Thubun River. Ground magnetometer and electromagnetic surveys were recommended over anomalies corresponding to showings on claims CB 2 and BELL 2.

An electromagnetic survey covering 3 line miles was conducted May 8 to June 10, 1968, over the geoelectromagnetic anomaly near the showing on claim CB 2. A magnetometer survey covered 1 1/2 line miles. These surveys were done with an average station spacing of 75 feet. The surveys resulted in the location of two conductors, one 600 feet long and 100 feet wide and the other 400 feet long and 100 feet wide, and a magnetic high coincident with one of them.

During July electromagnetic surveys were conducted on seven small grids, including one on the showing on claim BELL 2, to test other Klyceptor anomalies. The surveys were run using a Sharpe SE-600 horizontal-loop instrument at a frequency of 1,600 cycles per second. The surveys gave negative or weak responses over the airborne anomalies and the BELL 2 showing, except for a moderate conductor on claims BEV 93 and 94. A short diamond-drill hole was recommended to test this conductor.

Some geological mapping was done May 24 to June 2, 1968, and during 7 days in July near the main showings on the property. It was estimated that 40 per cent of the property is occupied by outcrop. The property was reported to be largely underlain by a migmatitic complex of pink to dark greenish grey granulite and gneiss with intrusions of pink to brick red aplite and granite. Greenish grey to nearly black, fine- to medium-grained, chloritized, basic igneous rock forms a more or less concordant band that is more than a mile long and up to 1,500 feet wide. Salmon pink to deep red, fine- to coarse-grained, equigranular to porphyritic, fresh-looking, late granite intrudes both the migmatite complex and the basic rock.

A major fault striking N60° E is present along the shore of Great Slave Lake. Within 2 miles of the shore there are at least three other parallel or subparallel major faults. A fifth major fault, with a strike of about N80° E, is believed to be present along Thubun River.

Pyrite and chalcopyrite, found here and there in all the rock types, occur in veins of quartz, carbonate and/or barite. Barite appears to be predominant only in veins in mafic rocks, and quartz and calcite are more abundant in veins cutting acidic rocks. Chalcopyrite appears to be most concentrated in veins which cut inclusions of dark gneiss or mafic igneous rock in late granite. Some fluorite and hematite are also found in the veins.

Main Showing

This is a breccia zone about 1,500 feet long and 5 to 30 feet wide that is located on claims BEV 99 and 96. The zone strikes N60° E through pink granite and inclusions of migmatite and basic igneous rock. The eastern third of the zone follows a linear contact between basic igneous rock on the north and granite on the south. The matrix of the brecciated band is formed by quartz, calcite, and barite which contain accessory hematite, pyrite, fluorite and chalcopyrite. Concentration of chalcopyrite is greatest where chloritized basic material is included in the granite and where the brecciation is the strongest.

Two chip samples from trench No. 2 across the best part of the showing, about 400 feet from the west end of the zone, indicated a grade of 1.02% Cu and 0.12 oz./ton Ag across a true width of 6 feet or 0.70% Cu across a width of 22 feet. However, a drillhole beneath this trench intersected a breccia zone 40 feet wide containing heavy mineralization across only a few inches. A trench, No. 5, located 700 feet to the northeast indicated some barite stringers across a 4.3-foot width of sheared, chloritized and silicified rock. A sample taken across this zone assayed 1.54% Cu and 0.08 oz./ton Ag. A 4-foot section of core from a hole drilled beneath the trench was estimated to contain less than 1% chalcopyrite. Three other trenches across the breccia zone were visually estimated to contain about 0.5% Cu across a width of 15 feet.

CB Showing

This showing is located on claims CB 2, 3, 17 and 21 between two northeast-trending linear features which are considered to represent faults. Vertical tension fractures strike S70° E to S80° E in migmatitic country rock, possibly foliated paragneiss in part. Quartz and calcite veins up to 4 feet wide occupy the fractures and contain from a trace to greater than 30 per cent combined chalcopyrite and bornite. The veins also contain pyrite, fluorite, dolomite and fragments of quartz and wallrock. A selected sample from the veins assayed 9.3% Cu and 0.20 oz./ton Ag.

The Mohagen vein has been exposed for a length of 150 feet and averages 3 feet in width. South of this vein three short sections of rich vein material, each about 2 feet wide, have been exposed by trenching. Channel samples from the most southerly trench gave assays of 2.69% Cu and 0.18 oz./ton Ag across a width of 1.3 feet, or 1.34% Cu and 0.20 oz./ton Ag across a width of 3.4 feet.

Other showings

The Northeast showing consists of chalcopyrite in shears and a number of quartz-carbonate veins located on the north parts of claims BEV 95 and 102. The Southwest showing is located on claim BEV 73 and consists of chalcopyrite-bearing barite-fluorite veins within a sheared and brecciated zone up to 20 feet wide. This zone has been traced for a length of 600 feet.

A showing on claims BEV 100 and 125 on the east side of a large island in Great Slave Lake is a steeply dipping breccia zone which strikes N45°E

in pink granite, granulite gneiss and basic rock. The zone is 2 to 10 feet wide, 300 feet long and pinches out in outcrop at both ends. The breccia zone contains 5 to 30 per cent matrix material consisting of quartz, calcite and a little fluorite. From less than 1 per cent to more than 5 per cent chalcopyrite occurs disseminated in the breccia fragments and as blebs and stringers in the matrix.

A showing on claim BEV 120 is located on the south shore of a small island in Great Slave Lake. This showing consists of a narrow breccia zone that is exposed for a length of 100 feet before passing into the lake at either end. A nearly continuous seam of massive chalcopyrite from 1 to 4 inches wide occurs within the breccia zone.

The geological mapping on the property apparently covered all or part of claims BEV 2, 3, 11, 12, 14, 24, 45, 46, 47, 76, 82, 91-93, 95, 96, 99 and CB 2, 3, 17, and 21. It was concluded that the Northeast and Southwest showings were of no interest other than indicating the widespread distribution of copper. It was considered possible that significant copper zones could be located in the vicinity of the Main and CB showings.

Four diamond-drill holes were recommended on the property. One hole 200 feet deep was recommended to test a conductor on claim CB 2. A hole 340 feet long was recommended on claim CB 3 to test a conductor 600 feet long and the downward extension of the Mohagen vein. Two other holes were recommended on this claim to test a conductor 400 feet in length. Some additional geological mapping was also recommended on the property. Plans to do some drilling on the property were announced in September (The Northern Miner, Sept. 5, 1968, p. 6).

Hogan Mines Ltd. (HL, HH and HC claims)
(85-H-9; about 61° 30'N, 112° 21'15"W) (Uranium)

The HL 1-6 claims were recorded in August, 1966, by Mr. G. Weyrowitz. A visit was made to the property on June 17, 1967. The claims are located about 2 miles south of the East Arm of Great Slave Lake and 6 1/2 miles east of the mouth of the Thubun River. The claims were staked to cover uranium showings discovered by Mr. Weyrowitz.

A uranium showing at about 61° 32'N and 112° 21'15"W occurs in highly metamorphosed rocks which have the characteristic northeast-southwest structure for this area, parallel to the strong faulting along the south part of the East Arm. Pitchblende stringers occupy narrow cross fractures in certain bands of what appears to be a recrystallized (welded) acidic mylonite. This rock contains narrow amphibolite bands parallel to foliation and, in part, the fine pitchblende-bearing cross fractures are along these narrow amphibolite bands. The radioactive zones are very narrow, rarely 4 feet wide, and the few which were examined are only 6 to 12 feet long.

The HH 1-11, HC 1-11 and other claims in the area were probably staked in late 1966 or in 1967. Twenty-eight claims were subsequently taken under option by Hogan Mines. A scintillometer survey was carried out by Precambrian Mining Services April 13 to July 4, 1968. This survey was done jointly for Hogan Mines, Fort Reliance Minerals and Nahanni Mines. The latter companies hold 53 adjoining N, U and J claims on a joint basis. The Fort Reliance-Nahanni property consists of claims N 4-7, 15-19, 22-24, 26-28, 32-36, U 1-9, 16-34 and J 1-8.

The scintillometer survey was done along lines spaced 250 feet apart and indicated two areas in which there are scattered radioactive highs. Detailed surveys were done in these two areas with readings being taken each 10 feet on lines 100 feet apart. The average background was found to be 70-90 counts per second over outcrop and 30-40 c.p.s. over overburden. The scintillometer work indicated a number of large areas of weak radioactivity, generally 2 to 3 times background. These areas appeared to be correlative with outcrops of reddened porphyritic zones which show minor fracturing.

Detailed grid BL 3 covered parts of claims HH 2, 3 and U 21, 22. The area is several hundred feet wide and extends for 3,000 feet along the strike of the well exposed altered sedimentary rocks. Very narrow zones of high radioactivity are associated with minor fractures. In general the zones of radioactivity can be traced along strike for only short distances and no continuity could be established between grid lines.

A second zone was located by earlier prospecting and had been investigated by a few small pits. Two of the fracture zones here showed high radioactivity for a length of 50 feet. This is probably the zone visited by the author in 1967. The showing visited by the author is located just south of a pond and near the mutual corner of claims HL 2 to 5. A sample that was apparently taken from shallow pits on this showing assayed 0.21% U_3O_8 by chemical analysis.

A third zone of interest was located during the reconnaissance survey and consists of northeasterly trending migmatites and gneisses located between porphyritic gneisses with a high radioactive background. These rocks can be traced southwest to northeast for 1,300 feet and also continue northeast and are found north of "H" Lake. The overall radioactivity for the migmatites is about 150 to 200 c.p.s., but over some quartz-rich zones the radioactivity is higher. In a few scattered areas yellow secondary uranium minerals were noted and the radioactivity was up to 3,000 c.p.s. The most concentrated zone of radioactivity in migmatite was located 500 feet north of the survey grid on an extension of line 62W. Readings of 1,000 c.p.s. were obtained across a width of 40 feet. This zone was being tested by trenching, but the results are not known. Scintillometer readings along strike on the well-exposed zone were much lower.

It was reported (The Northern Miner, July 11, 1968, p. 5) that the scintillometer survey had indicated six radioactive zones and that these were being investigated by trenching. It was later reported that samples from the Milt zone, unidentified as to location, had indicated a grade of 0.05 to 0.15% U_3O_8 by both radiometric and chemical assay.

Mr. G. Weyrowitz (EAGLE 1-5 claims)
(85-H-9; about 61° 38'45"N, 112° 13'W) (Uranium, Copper)

Prospecting on this old group of claims by Mr. G. Weyrowitz in 1967 resulted in the location of a number of uranium showings, in addition to the previously known copper showings. The property was visited by the author on June 17, 1967.

On claim EAGLE 1 uranium mineralization is present in a sheared zone just at the shore of a small bay. This showing is at approximately 61° 38'45"N and 112° 13'30"W. The radioactive shear zone appears to be in a less metamorphosed patch of altered greenstone within rocks which generally

contain abundant red feldspar porphyroblasts, and granitic stringers parallel to foliation. The sheared zone is over 15 feet wide at the shore of the bay but extends for only 25 to 40 feet, with two minor fractures extending for 70 or 80 feet from the shore. Radioactivity is associated with chalcopyrite, some bornite and pyrite, and calcite and quartz. Altered (chloritized? and silicified) black rock also shows good radioactivity. The best part of the zone may lie under the water of the bay.

A showing which gives fair radioactivity over a relatively large area occurs at the end of the bay on claim EAGLE 2 at approximately 61° 38'50"N and 112° 13'W. The radioactivity occurs in a foliated granitic rock which has been sheared and shows hematitic alteration. This rock gives way to amphibolite just southwest of the showing. The amphibolite appears to have formed by shearing and metamorphism of greenstone. The radioactive zone had only been poorly exposed by trenching.

Valnicla Copper Mines Ltd. (CO 1-9 claims)
(85-H-10; about 61° 37'00"N, 112° 46'50"W) (Copper, Cobalt)

This property covers showings located on a small island just north of the main Petitot Islands in the East Arm of Great Slave Lake. A preliminary report on the property was prepared early in the 1966 season by Precambrian Mining Services Ltd. Later in the 1966 season, or possibly early in 1967, four short holes totalling 180 feet were drilled on the main mineralized zone on the property. The core from this drilling was logged by Resource Management Ltd. The holes penetrated biotite gneiss and granitic dykes, and possibly bands of granitic rock conformable with the gneiss.

The copper and cobalt mineralization on the property is associated with a north-trending shear zone. Samples from trench No. 201 on this zone assayed 3.38% Cu and 0.98% Co across a width of 4 feet. A sample from trench No. 202, located 30 feet to the south, assayed 1.21% Cu. Holes 1, 2 and 3 were drilled around this trench. Holes 1 and 2 intersected minor copper and cobalt mineralization. The core from hole No. 3 assayed 1.59% Cu and 0.3% Co for a 10-foot intersection from 10 to 20 feet in the hole, and 3.21% Cu and 0.22% Co for the following 10-foot intersection. Trench No. 203 is located 80 feet south of trench No. 202. This trench, hole No. 4 drilled in its vicinity, and two additional trenches along a further 70-foot-length of the zone, all gave only minor copper and cobalt values.

The mineralized shear zone at its north end strikes about N10° to 22° W, while toward the south end it curves to a strike of slightly east of north. One sample from the property was reported to have assayed as high as 0.95 oz./ton silver (Western Miner, Oct. 1966).

Jason Explorers Ltd. (DEE 1-17 claims)
(85-H-16; about 61° 59'N, 112° 25'W) (Nickel, Cobalt, Bismuth)

An arsenide showing was discovered on Blanchet Island by Mr. F. Giauque during the 1968 season. Claims staked to cover the showing were later acquired by Jason Explorers. It was later reported that a massive arsenide zone 4 feet thick had been investigated in two trenches in a skarn

zone near the crest of an anticlinal structure (News of the North, Yellowknife, Dec. 12, 1968). Samples of the mineralization assayed as high as 15% Ni and 10% Co.

The company established a camp on the property prior to the end of 1968. It was planned that a crew would work on the property extracting and stockpiling the arsenide ore in preparation for barge shipment the following summer.

Numac Oil and Gas Ltd. (50%) and Shield Resources (50%) (NC 1-227 claims)
(85-I-2; about 62° 07'N, 112° 47'W) (Nickel, Titanium)

This property covers the differentiated mafic intrusion which lies east of François River in the vicinity of Hearne Channel in the East Arm of Great Slave Lake. Some nickel-cobalt arsenide veins are known to cut the intrusion (Lord, 1951, p. 152).

Some investigation of titanium-bearing magnetite-rich zones in the northern part of the intrusion was carried out by the Earl-Jack Syndicate, a predecessor of Shield Resources, in 1962 or 1963. The NC claims were staked late in 1968 and cover a large part of the mafic complex.

Horizontal-loop electromagnetic and magnetometer surveys were carried out November 27 to December 19, 1968, on parts of claims NC 163, 164, 174-177, 186-189, 197-200, 206-208 and 214. The geophysical grid was located southeast of the two MAPLE claims and was centred at roughly 62° 04'15"N and 112° 47'15"W. The MAPLE claims are held by Falconbridge Nickel Mines and cover the main niccolite veins that are known to cut the mafic intrusion. Each geophysical survey covered about 18 line miles along northwest-southeast lines spaced at 400-foot intervals. Readings were taken each 100 feet along the lines and a coil separation of 200 feet was used for the electromagnetic survey.

The magnetometer survey was expected to respond to titaniferous magnetite and ilmenite in the anorthositic parts of the intrusion, as well as to pyrrhotite-pyrite-chalcopyrite mineralization in the gabbroic phases. However, a pronounced negative anomaly was found in coincidence with the sulphide mineralization and it indicated that the sulphide zone was of limited extent. One weak conductor was located by the electromagnetic survey and was considered as possibly due to a niccolite vein.

Mr. P. D'Aoust (DM and MDM claims)
(75-E-13; about 61° 57'N, 111° 49'22"W) (Uranium)

This property on the southeast side of Union Island was staked to cover a radioactive zone located by P. D'Aoust. The property consists of 36 DM and 12 MDM claims and was visited by the author on July 20, 1967.

The main showing consists of a narrow, highly radioactive, silicified, and pyritized fault zone in dolomite. The fault strikes slightly east of north and dips about 55° E. The plane of the fault corresponds closely to the slope of the hillside and thus the radioactivity, although apparently concentrated across a width of only 1 foot to 2 feet, is fairly widespread on the surface. Yellow secondary uranium minerals are very evident as a stain on the most radioactive boulders.

It would appear that this fault may have a length of about 3,500 feet and terminate at either end against more significant northeast-trending faults (Stockwell, 1936a). Topography and other features suggest two such faults about 1,800 feet apart. Near the hypothetical junction of the cross-fault with the most northwesterly of these faults some radioactivity is present in contorted shale lying east of the north-trending cross-fault.

An option was taken by Northwest Explorers on the property, for at least a short period of time, near the end of August, 1967. Preliminary samples from the No. 1 pit gave radiometric assays of 0.09, 0.015 and 1.35% U_3O_8. Pit No. 2 yielded samples which assayed 0.025% U_3O_8/ 5 ft., 0.015%/8 ft. and 0.06%/2 ft. Two samples from Pit No. 3 assayed 0.95% U_3O_8/in. and 1.25% U_3O_8/6 in. It was concluded that the showing lacked sufficient continuity to warrant further investigation.

The property was investigated by R.S. Taylor, consultant, April 5-7, 1968. Background radioactivity on the property was found to be 0.005 milliroentgens (MR)/hour, and readings up to greater than 5 MR/hr. were obtained. Readings of 50 times background or more were obtained at many points along a length of about 200 feet in a zone encompassing the 3 pits from the previous season. This zone, as noted above, corresponds to a fault, and this fault apparently parallels another major fault lying about 1/2 mile to the northwest. Readings of 4.5 to greater than 5 MR/hr. were obtained in Pit No. 3. Readings were up to 200 times background in Pit 1 and up to 300 times background beside Pit 2. Readings of up to 100 times background were obtained along a depression marking a fault with a north-northwest strike.

Seven chip samples were taken and analyzed both chemically and radiometrically. The low chemical results, in relation to the radiometric values, were surprising and could not be explained. A sample from Pit 3 gave a radiometric assay of 1.85% U_3O_8. The assay results are listed in a table below.

Sample No.	% U_3O_8 (Chemical)	% U_3O_8 (radiometric)
1	0.022	0.03
2	0.170	1.85
3	0.196	1.35
4	0.009	0.09
5	0.030	0.17
6	0.049	0.06
7	0.011	0.09

A program of diamond drilling to consist of three holes totalling 330 feet was recommended on the property. The drilling was recommended, in part, to avoid the problem of surface weathering.

Mr. R. Steiner (TEL claims)
(75-E-13; about 61° 58'N, 111° 47'12"W) (Uranium)

This property is located within the East Arm of Great Slave Lake on a long narrow island lying south of the east part of Union Island. A radioactive showing was located here by E. Carmody during the 1967 season, while

he was being assisted by the Federal Government under the Prospectors Assistance Program. The TEL claims were staked in May, 1967.

The radioactivity is in fractures filled with fine specular hematite (red ochre) in highly fractured or brecciated irregular areas in quartzite. While the quartzite has been brecciated at these localities, the fragments have in many cases not been displaced from their relative positions. The quartzite, which belongs to the Sosan Formation, is very similar in many respects to the Matinenda Quartzite of the Blind River area, Ontario. Some grit bands are present in the quartzite, as also are sericitic-arkosic bands. In places fairly widely spaced quartz pebbles can be traced along a particular bedding horizon, although no distinct conglomerate beds were noted.

In the fractured areas the fractures tend to be parallel or perpendicular to the bedding. The largest radioactive area that had been investigated when the property was visited on July 20, 1967, was about 20 feet wide by 40 feet long. Away from the areas of fracturing individual hematite-containing fractures cutting across the quartzite commonly show some radioactivity along part of their length. It is worthy of note that some narrow hematite bands appear to be definitely sedimentary beds within the quartzite. Along the north edge of the island brecciated red shale appears to be in fault contact with the quartzite.

Cominco Ltd. acquired an option on the property from Mr. Steiner prior to the 1968 season. Prospecting, trenching, sampling, geological mapping at 1,000 feet to the inch, and a scintillometer survey were done on the property May 15 to July 20, 1968. Some preliminary sampling of the showings was done in September 1967.

The Sosan Formation was found to consist of pebbly quartzite at the base. This unit strikes northeast and dips 60° - 70° SE, and is the host for uranium, thorium and silver mineralization. This basal unit is overlain by fine- to medium-grained dark pink quartzite with minor interbedded iron-formation and thin-bedded sandstones. This unit strikes N 25° E, dips 60° - 75° SE and is overlain by an intraformational breccia composed of fragments of both unerlying units.

Brown-red dolomites and shaly dolomites of the Kahochella Formation are present along the south edge of the island. The dolomites strike N 60° E and dip steeply to the southeast.

An isolated lens of pitchblende and chalcopyrite was found near the contact between rocks of the Sosan and Wilson Island Formations. This lens is 2 feet wide and 4 feet long, and grades 0.14% U_3O_8.

Faults are common on the island and generally strike at acute angles to its length. Locally the quartzites are moderately to intensely fractured. The best mineralization on the property occurs within an area about 500 feet by 2,200 feet but appreciable uranium or silver values are restricted to very local areas. The background radioactivity was found to be very low, and the most widespread above-background radioactivity was found to be due to appreciable amounts of thorium.

The most radioactive zones, generally not more than 50 feet in any one dimension, were investigated by trenching. Channel samples were taken in trenches blasted to depths of up to 6 feet. The assay results from this work are listed, in part, in the table following.

Trench No.	Claim	Sample Type	$\%U_3O_8$ (chemical)	Ag (oz./ton)
RN-1	N 86769	12-in. channel	< 0.005	1.86
		24-in. channel	0.007	tr.
		12-in. channel	< 0.005	0.86
RN-9	N 86770	24-in. channel	tr.	0.7
		24-in. channel	tr.	0.9
		Grab	tr.	0.3
RN-10	N 86771	Grab	1.59	1.4
		20-in. channel	0.143	0.1
		Grab	0.091	0.1
		28-in. channel	0.056	tr.
		30-in. channel	0.208	tr.
1 B	N 86790	Grab	tr.	2.3
		Grab	tr.	13.7
		Grab	tr.	4.8
3 B	N 86790	Grab	-	2.8
		Grab	-	0.8

Copper Pass Mines Ltd. (GOGO 1-5 claims)
(75-L-5; about 62° 24'25"N, 111° 51'55"W) (Nickel, Cobalt)

This property is located 17 miles southwest of Taltheilei Narrows and 5 miles northwest of Sachowia Point (Geol. Surv. Can., Map 1122A). The property was originally staked in August, 1940, as the BM group of Consolidated Mining and Smelting Company. The nickel arsenide showing was later covered by the NIX group of claims which was held by C. McAvoy from approximately 1950 to 1958. Four holes totalling 117 feet were drilled on claim NIX 4 in 1950. One hole intersected a width of about 8 inches of massive niccolite and another showed some annabergite in a narrow carbonate-bearing breccia zone.

Ventures Resources took an option on the property in 1957 and reportedly did 3,000 feet of diamond drilling, although apparently only 17 holes totalling 2,147 feet were recorded as representation work. Many of these holes were collared in the chilled margin facies of a diabase dyke near which the mineralization is concentrated. The holes were inclined at angles of 45° to nearly 70°. The veins are in metamorphosed basic to intermediate volcanics, with minor associated sediments, of the Yellowknife Group. However, mineralization appears to be associated, in particular, with bands of red granite which have been sheared and brecciated, and which have been veined or cemented by carbonate and lesser quartz. Some comments on the results of selected holes are given below.

Hole 1 Talc schist and schistose greenstone. Erythrite at 18 feet.
Hole 4 Some niccolite stringers 61 1/2 to 63 feet. Pyrite, niccolite and grey Co-Ni arsenides.
Hole 5 Massive niccolite 73 to 76 1/2 feet in red granite veined by carbonate. Disseminated mineralization elsewhere from 68 1/2 to 94 feet.
Hole 8 A stringer of grey Co-Ni arsenides 2 feet wide is present in carbonate which cuts red granite between 16 and 19 feet. Carbonate and grey arsenides are also present 19 to 23 feet.
Hole 9 Vein of grey Co-Ni arsenides and minor niccolite 2-3 inches wide in granite at 90 feet.

Hole 11 Two-inch vein of grey Co-Ni arsenides in biotite-hornblende schist at 21 feet. Scattered ore minerals 59 to 68 feet in acidic volcanic rock (?). Ten-inch vein of niccolite at 83 to 85 feet in red granite.

Hole 12 Some niccolite at 30 feet and some grey Co-Ni arsenides at 66 feet in acidic volcanic rock (?). Possibly seams of arsenides between 101 and 111 feet.

Hole 13 Niccolite stringers and some grey Co-Ni arsenides at 53 to 60 1/2 feet in brecciated granite which has a quartz and carbonate matrix. A 2-inch vein of niccolite at 69 1/2 feet.

Most of the NIX group lapsed in 1960, but claim NIX 5, on which most of the drilling was done, was in good standing to October 21, 1965. The property was restaked December 8, 1965, as the GOGO group for G. E. Oystrek of Edmonton. The claim GOGO 2 covers the approximate area of the former NIX 5 claim. A geological report was prepared for Mr. Oystrek on the GOGO claims in 1967 by W. L. McDonald.

The main nickel showing is located near the southeast corner of claim GOGO 1. The showing occupies a breccia-bearing sheared and fractured zone. Near the showing the rocks are reported to consist of a mixed complex of greywacke, minor quartzite, basic intrusives and fresh red granite dykes. The granite is unaltered, but all other rocks are much altered and generally schistose.

The main zone is 4 to 12 inches wide, is nearly vertical, and is exposed for a length of 120 feet in an open-cut along the zone. The vein strikes about N 20° E and may extend farther in either direction beneath the rubble. Masses of niccolite weighing up to 100 pounds, as well as small blebs, occur throughout the zone. Cobalt is abundant in parts of the vein, especially near the southwest end. A vein striking about S 15° E extends south from the main vein at a point near the north end of the latter. About 20 feet east of the north end of the main vein an approximately parallel niccolite vein is exposed for a short distance.

About 700 feet north of the main showing, and on the north side of a valley, there is a second niccolite showing. This showing was previously investigated by trenching.

The regional shearing of the rocks strikes about N 45° E, while later fractures containing niccolite mineralization strike about N 20° E. Investigation of all depressions with the latter trend was recommended. Prospecting and detailed geological mapping of the property were also recommended.

A stockpile near the main showing was estimated to contain 12 to 15 tons of high-grade nickel ore. It has been suggested that a lens of niccolite in the main zone contains about 5,000 tons of the massive mineral, and that a concentrate would contain about 15% arsenic.

Copper Pass Mines Ltd. acquired an option on the property prior to the 1969 season.

Territorial Expeditors (CC and FF claims)
(75-L-6; about 62° 17'05"N, 111° 17'10"W) (Uranium, Nickel, Cobalt, Silver)

These claim groups cover two radioactive occurrences that are shown on Map 1122A (Stockwell et al., 1968a). The location given above is for the 14-claim CC group. This group is located 20 miles southwest of the settlement

of Snowdrift and about 2 1/2 miles north of the west end of Murky Channel. The showings are located in or are closely associated with diorite intrusions.

The CC group was staked in 1967 to cover showings previously covered by the GM claims. Samples from these showings were reported to have given assays of 0.065, 1.75, 6.10 and 12.00 radiometric equivalent uranium (Lang, 1952).

Chip or channel samples taken from one of the old trenches assayed 0.9% U_3O_8 and 1.4 oz./ton Ag across 18 inches, and 0.195% U_3O_8 across 3 feet. Showing A consists of a steeply dipping vein about 4 inches wide in diorite. This vein is located at about 62° 17'10"N and 111° 17'25"W and was investigated by trenching and sampling. Near-surface samples from one trench assayed 0.16 oz./ton Au, 1.1 oz./ton Ag, 2.25% U_3O_8 (radiometric), and 1.93% Co. After this trench had been deepened, one sample was obtained which assayed 5.83% Ni and 7% U_3O_8 radiometric (6.975% U_3O_8 chemical), and another assayed 12.19% Co, 2.62% Ni and 0.2 oz./ton Ag. A sample from another trench assayed 1.7 oz./ton Ag and 1.33% U_3O_8.

The rest of the showings on the property are reported to be similar to the veins on the REX property at Stark Lake (75-L-8). The main gangue minerals in these veins are actinolite and apatite. The showings are also reported to be located in the diorite close to its contacts with surrounding sediments of the Stark Formation.

The 4-claim FF group is located at about 62° 18'40"N and 111° 12'W. The radiometric assay of a sample from this property indicated a grade of 0.225% U_3O_8.

Channel Copper Mines Ltd. (SPD 1-16 claims)
(75-L-6; about 62° 15'45"N, 111° 11'45"W) (Copper)

Twelve of the claims making up this property were recorded on August 18, 1966, by L. Pridie of Hay River. Claims SPD 13-16 were added in October, 1966. The property was first visited by the author on August 25, 1966, and subsequent visits were made on July 20, 1967, and July 18, 1968.

The showings consist of bornite and bornite-chalcopyrite veins in grey to black shale which occurs as a narrow slice lying north of the fault along Murky Channel. The shale was mapped by Stockwell (1936b) as part of the Wilson Island Group, although it seems possible that it may belong to the Kahochella Formation. The shale is much contorted and near Murky Channel it is not possible to distinguish bedding. Some brecciation of the shale is noted just along the shore of Murky Channel.

The copper-bearing veins consist of small shear or breccia zones which are variable in strike, but show a general tendency to be oriented perpendicular to Murky Channel. Carbonate minerals commonly form the gangue in these veins. The veins are up to one foot wide and have been exposed by trenching for lengths up to 50 feet, although small stringers are also present adjacent to the veins. In a few places where silicification has occurred, minor galena, pyrite, sphalerite and marcasite are present.

Narrow drift-filled valleys run parallel or subparallel to Murky Channel. These valleys may represent major shear or fault zones, which could have controlled the copper mineralization and may themselves be mineralized.

Showings were being trenched and sampled, and some small-diameter core drilling was in progress, when the property was visited in 1966. Prospecting was started on the property on July 20, trenching on August 6, and diamond drilling on August 9. A total of about 40 pits and trenches were excavated on the property before investigations were terminated for the season on September 25. At least two holes to depths of 32 and 75 feet were drilled. The trenches investigated copper showings in shale on a point of land on claims SPD 1 to 4. The showings form a zone about 4,000 feet long and up to about 500 feet wide.

Further trenching and drilling was done on the property in 1967. Sampling of a pit near the north side of a band of highly brecciated shale which forms a ridge on claim SPD 2 was reported to have given about 3.2% Cu across 4 feet. The pit exposed good bornite mineralization. Drilling with a larger machine during 1967 was reported to have totalled about 900 feet, and more X-ray drilling was also done.

Work on the property in 1968 started on July 17 when a Komatsu bulldozer, a front-end Payloader, a 3/4-ton panel truck and several tanks of fuel were delivered by barge to the property. During the remainder of the season roads were established for easier access to the showings on the property, some bulldozer trenching and conventional rock trenching were done, and a limited number of additional holes were drilled.

Elgin Petroleum Corp. (MARY 1-4 claims)
(75-L-7; about 62° 22'30"N, 110° 51'47"W) (Barite)

This barite showing has been briefly mentioned by Barnes (1951) and its location is shown on his map of the area. The claims covering the showing were recorded on April 12, 1966. Trenching of the vein was done by Precambrian Mining Services in August, 1966. The property was held in the name of Botha Lake Mining Corp. Ltd. when it was visited on August 25, 1966.

The showing consists of a vein of nearly massive barite which parallels the bedding in limestone striking northwest-southeast and dipping very steeply northeast. The most southeasterly trench shows a width of 2 1/2 feet of barite with the northeast contact unexposed because of deep overburden. The second trench is located approximately 75 feet to the northwest and exposes a 10-foot width of barite. An additional 55 feet along strike the vein is 5 1/2 feet wide, but 20 feet farther northwest a trench exposes a width of only 1 1/2 feet. According to Barnes the limestone within which the barite vein is located belongs to the Kahochella Formation. Sediments nearer to the shore of the lake are ferruginous shales which Barnes places in the Stark Formation. A granodiorite intrusion is exposed a few hundred feet west of the showing.

It should be noted that the vein is located on a very steep hillside. Considering the nearly vertical dip of the vein, this suggests that further exploration or development could be accomplished via an adit.

Spectroair Explorations Ltd.
(Nonacho Lake, East Arm of Great Slave Lake)

This company was formed by Madrona Explorations, Croydon Mines, New Cronin Babine Mines, and Silver Ridge Mining Co. to explore for uranium in the Northwest Territories. Seigel and Associates Ltd. were the

consulting geophysicists for the company. During the 1966 season gamma-ray spectrometer flying was done in the East Arm of Great Slave Lake, from Keith Island to Reliance, and in the Nonacho Lake belt of sediments.

The company's exploration camp at Graveyard Bay, near Snowdrift, was visited on August 25. A Helio Courier airplane was being used for the airborne survey. The flying was being done, with considerable difficulty due to the moderately rugged topography, at an elevation of 150 feet above ground level. The interval between flight lines is not known but may have been 750 or 1,000 feet, and could have been as little as 500 feet. The radioactive occurrences that were used for control or calibration purposes included the thorium-rich showing near the southeast end of McLean Bay (Barnes, 1952).

Scurry-Rainbow Oil Ltd. (ACE, DON, REX, PAT and MABEL claims etc.)
(75-E-8; about 61° 22'20"N, 110° 16'W) (Uranium)

Canadian Pipelines and Petroleums Ltd., a predecessor company, carried out a drill program of nearly 20,000 feet in 57 holes on this property in 1955, and possibly early 1956. This drilling was largely concentrated on the ACE claims. The property is located at MacInnis Lake and, in addition to the above groups, includes the TRIX, RED, GINGER and CARL groups for a total of 114 claims.

The mineralization on this property consists of fine pitchblende stringers cutting a greywacke-arkose-conglomerate section. Most of the pitchblende is in dark brecciated arkose or greywacke. It is reported that the drilling outlined a small ore lens, possibly a few hundred feet long by up to 6 feet wide. The best assays reported in the drill logs are (1) 0.84% U_3O_8 over a width of 2 feet at a depth of 532 feet in hole No. 53, with 0.08% over an adjacent 3 feet, (2) 0.56% U_3O_8 over a width of 1 1/2 feet at a depth of 15 feet in hole No. 5, and (3) 0.31% U_3O_8 over 2 feet at a depth of 485 feet in hole No. 58, with 0.05% over an adjacent 5 feet. It appears that this early drilling outlined a shoot containing an estimated 30,000 to 50,000 tons of material that could be considered of ore grade.

During the period July 3-28, 1968, some further geological and scintillometer investigation of the property was done. Very little radioactivity was found other than in association with the known showings. The main showings are termed the Welch and Dusseault. These showings are reported to be in areas with abundant fractures and minor faults in a north-south band of interbedded siltstones and mudstones along the west shore of MacInnis Lake. The sediments dip vertically or steeply to the east. The relation between this mineralization and that discussed above in the coarser sediments is not clear, although the latter generally appears to occur at a depth of about 500 feet. Minor chalcopyrite was found to be associated with all the radioactive occurrences on or near the property. On the basis of this investigation it was concluded that no further work was warranted on the property.

Territorial Uranium Mines (PYRAMID 1-50 claims)
(75-E-8; about 61° 16'45"N, 110° 11'W) (Uranium)

This 50-claim property is located at MacInnis Lake and claims 1-36 were staked by S. Yanik in July 1966. The claims were subsequently acquired by Territorial Uranium Mines, a newly formed company. Showings are

reportedly known along a length of 500 feet (The Northern Miner, Jan. 5, 1967) with pitchblende occurring over widths of 1-2 feet in two bands 80 feet apart. The showings were reported to occur in sheared amphibolite in a section of interbedded quartzite and greenstone which occupies the general contact zone between granite and conglomerate. Geological mapping and a minimum drilling program of 6,000 feet was recommended to the company by J. Foster Irwin, consulting engineer.

Drilling was carried out on the property January 23 to February 16, 1967, prior to break-up. Ten holes totalling 2,613 feet were drilled on the property with negative results. A brief inspection of the core was made on August 10, 1968. The holes intersected what appears to the author to be dirty mafic (quartz-poor) greywacke of the type commonly encountered in the Nonacho sedimentary belt. The sediments have been metamorphosed and are cut by numerous dykes (?) of reddish aplite. Coarser grained granitic stringers of reddish feldspar and quartz, and larger intrusive bodies of diorite or feldspar-rich gabbro, also appear to intrude the sediments.

In the drill program holes 1-5 and 8 were located on claim PYRAMID 22, holes 6 and 7 on claim PYRAMID 21 and holes 9 and 10 on PYRAMID 15 near the boundary with PYRAMID 22. The holes were all inclined at about 45° and six of these were drilled to test the main mineralized shear zone. Good radioactivity, due to yellow secondary uranium minerals, was detected in four of five trenches along the main shear zone and in one trench on a minor subsidiary zone located 100 feet to the east. No radioactivity was detected in the drill core and the main shear zone was found to narrow with depth. No pitchblende was identified in the trenches.

A small island in the lake consists of crushed quartz. This quartz zone lies just west of the main shear zone and contains minor amounts of pyrite and chalcopyrite.

The shear zone is reported to be in granitized greenstones and associated granitic rocks. The rocks are now foliated and altered amphibolites with interbanded granites, the whole sequence having an essentially migmatitic appearance. It is thus evident that the original character of the rocks is much in question. The shear zone consists of crushed and altered "amphibolite" that is cut by calcite and quartz veinlets in a stockwork-like pattern. Some hematite, talc and pyrite occur in vuggy fractures. The main mineralized fractures strike N30° E and dip 70° -85° west, but minor uranium mineralization is also associated with a set of cross fractures. The main shear zone passes beneath a lake to the northeast and beneath a swamp to the southwest. The subsidiary mineralized zone has a length of less than 400 feet.

Detailed prospecting and further scintillometer work were recommended on the property.

Mr. R. Jenkins (JLC 10-18 claims)
(75-F-4; about 61°05'N, 109°58'W) (Uranium, Copper)

This property is at the south tip of a bay of Thekulthili Lake. Granitic-appearing sediments with greywacke and conglomerate interbeds are present west of the bay. These sediments strike north-south and appear to dip about 15° east. Here and there the conglomerate interbeds and some very mafic-rich bands contain appreciable pyrite. These pyrite-rich beds have weathered to give rust-stained outcrops. The conglomerate beds contain predominantly quartz pebbles when pyrite is present in appreciable amounts. While these narrow conglomerate bands resemble the uranium-bearing conglomerates of

the Blind River area, Ontario, chlorite is generally an important constituent of the matrix and the general sedimentary section is much more poorly sorted than that at Blind River.

The property was visited by the author on August 10, 1968. Trenches which had been excavated earlier in the season by A. Larocque of Fort Fitzgerald, were visited with him as a guide. The trenches are distributed across a width of about 800 feet, and this width may represent a stratigraphic thickness of about 250 feet. A grab sample of conglomerate containing chlorite and pyrite in the matrix was obtained from one of the pits and this assayed 0.03 oz./ton Au, 0.32 oz./ton Ag and 0.006% U_3O_8. Another grab sample from pit No. 7 near the south tip of the bay assayed trace gold, 0.4 oz./ton Ag and 0.0017% U_3O_8. This sample consisted of bedded mafic-rich tuffaceous (?) rock that was cut by quartz and pyrite stringers.

Granitic and high-grade metamorphic rocks are present east of the bay. Some trenching had been done on a copper showing located at about 61° 08'12"N and 109° 56'32"W.

A band of highly altered rock of a tan colour is exposed across a width of about 150 feet at the west edge of an area of outcrop. This rock probably consists of talc, sericite and minor carbonate. A few bands up to about 2 feet wide containing bright green chlorite or mariposite cut this rock. The latter bands contain disseminated bornite and may have formed by hydrothermal alteration of the talc-sericite (?) rock.

The talcose rock is succeeded to the east by a width of nearly 100 feet of garnet-bearing rocks. In part the garnetiferous rock consists of subhedral crystals about one inch in diameter in a fine-grained matrix containing much smaller garnet crystals. Veinlets of chalcopyrite are present along fractures in the garnet-bearing rocks. Toward the eastern edge of this band of rocks, near the contact with gabbro, the large subhedral garnets have largely been replaced by retrograde pyroxene and the matrix has been highly altered or replaced. The gabbro is exposed for a width of at least 100 feet, but its extent is not known due to the lack of outcrop.

Jason Explorers Ltd. (FD claims)
(75-F-5; about 61° 27'N, 109° 45'50"W) (Copper, Lead, Zinc, Silver)

This property is near Salkeld Lake in the Nonacho Lake area. Two main showings are known on the property. One of these showings, located on claims FD 11 and 12, was investigated by Giant Yellowknife Gold Mines in 1965. Mapping, geophysical surveys and several thousand feet of drilling were carried out in this program. The best drill intersection on this showing assayed about 2% Cu for a core length of 28 feet.

The second or "Gun" showing is located on claims FD 15 and 18, largely on the former. This showing has been described by Baragar (1962, pp. 20-21). The showing appears to be the one that was investigated in the area by Frobisher Ltd. in 1952. The work by Frobisher consisted of trenching on a showing located on what was then claim BASIN 1. The assay results from this trenching are presented on page 25. The sampling was done from west to east in the trenches. Trench 1B was simply a deepening of trench No. 1. A sample of disseminated sulphides in granitic (gneissic?) rock from 1450 N on the grid and 50 feet west of the baseline, which apparently represents a continuation of the mineralized zone, assayed trace Au, nil Pb, 0.33% Zn,

Trench	Latitude	Sample	Footage in Trench	Sample width (ft.)	Au(oz.)	Pb(%)	Zn(%)	Cu(%)	Ag(oz.)
1	1010 N	1	0.0'-1.5'	1.5	0.01	0.47	1.40	2.66	6.05
		2	1.5'-3.8'	2.3	0.02	2.67	17.44	11.93	26.89
		3	3.8'-8.8'	5.0	tr.	tr.	0.84	0.07	1.51
1B	1003 N	9	0.0'-1.8'	1.8	tr.	tr.	0.44	0.82	0.22
		10	1.8'-2.45'	0.75	tr.	tr.	2.99	3.24	0.63
		11	2.45'-3.7'	1.25	0.01	tr.	0.53	2.75	0.67
		12	3.7'-6.7'	3.0	0.01	Nil	0.33	1.41	0.69
5	1062 N	13	0.0'-1.0'	1.0	tr.	0.40	1.09	0.84	1.16
		14	1.0'-2.0'	1.0	0.01	1.06	0.22	1.10	3.17
		15	2.0'-4.0'	2.0	tr.	tr.	0.22	0.84	2.17
3	1127 N	4	0.0'-2.0'	2.0	0.02	1.58	8.09	10.54	10.60
		5	2.0'-8.2'	6.2	0.01	tr.	1.96	2.11	5.49
		6	8.2'-9.2'	1.0	tr.	Nil	0.16	0.17	0.85
		7	9.2'-15.4'	6.2	0.01	Nil	1.10	7.94	4.34
4	1277 N	8	0.0'-6.0'	6.0	0.01	0.35	1.10	3.77	7.29

1.22 oz./ton Ag and 0.78% Cu. At the time this work was done only material having a value of about $80.00 per ton was considered to be economic at this remote location. On this basis a band of ore-grade material averaging only about 2 feet in width and only 80 feet long, between 985 N and 1065 N, could be defined.

The FD group of claims is owned by F. Lypka of Yellowknife. During 1960 and 1961 the claims were under option to Canadian Nickel Company (Baragar, 1962, p. 20) and a program of geological mapping, diamond drilling, and geophysics was conducted around the Gun showing. At least five holes were drilled on the showing early in the 1961 exploration season. Assay results from the drilling or channel sampling done by Canadian Nickel are not known.

Jason Explorers was formed in British Columbia early in 1967 to acquire and develop this property in the Northwest Territories (Western Miner, June 1967, p. 76). Mr. J.D. Mason, consultant for the company, stated that "preliminary sampling of 400 feet of the zone exposed had indicated a grade of 20 ounces of silver per ton with 10 per cent copper and 6 per cent in lead and zinc."

Extensive trenching was done on the main mineralized zone on this property July 11 to 25, 1967. A total of eleven large trenches were excavated on claims FD 15 and 18, mostly on the former, along a length of about 1,000 feet. These trenches may, in part, represent deepening and extension of previous pits and trenches.

The main mineralized zone strikes about N15° E and contains heavy bornite with appreciable galena, sphalerite and chalcopyrite. The sulphides are associated with quartz in a generally conformable zone in gneiss. The gneissic rocks appear to be highly metamorphosed sedimentary rocks. In most of the trenches the mineralized zone appears to dip steeply to the west. Near the south end of the exposed part of the zone, however, the dip is vertical, and in the most southerly trench the dip is 73° E.

Following the trenching program early in 1967, a program of diamond drilling was undertaken on the property. The extent or results of this drilling are not known, although one long hole was reported to have given good results.

Mastodon-Highland Bell Mines Ltd. (ONA claims)
(75-F-13; about 61° 52'25"N, 109° 38'15"W) (Uranium)

This property was formerly staked by Eldorado Mining and Refining Ltd. as the NONA group to cover pitchblende mineralization in fine fractures in thick greywacke beds. The property is located on Nonacho Lake and the sediments are part of the Nonacho Group. The property was investigated by Eldorado in 1955. An area 1,000 by 200 feet was found to be somewhat radioactive. A single greywacke bed 2 to 3 feet thick was found to be moderately radioactive for a length of 125 feet. An assay result of 0.46% U_3O_8 was the best obtained from 33 grab samples. The best channel samples assayed 0.21% U_3O_8/2.3 feet and 0.31%/1.6 feet. Some radioactive mineralization was also found to be associated with pyrite in fracture zones and along bedding shears.

The ONA group consists of 40 claims numbered ONA 54, 56, 58-66, 69-75, 77-84, 86-95 and 97-100. The property was investigated in June and July 1966 by drilling five holes totalling 1,021 feet. Holes 1 and 1A were located near the southeast corner of claim ONA 62. Hole No. 2 was located

about 400 feet to the north-northeast on claim ONA 77. Holes No. 3 and 4 were located an equal distance south-southwest of No. 1, with hole No. 4 located on the shore of Nonacho Lake and about 150 feet east of hole No. 3. The latter two holes were drilled on claim ONA 60. The drilling intersected a formation consisting dominantly of massive, fine-grained, greenish grey arkose. This rock is cut by narrow quartz and carbonate stringers and in a few places is brecciated. Hematite is present in some fractures and shear zones cutting the sediments.

Some of the results of the diamond drilling are presented in the table below. The uranium values were determined by chemical analysis.

Hole No.	Bearing	Inclination	Depth(ft.)	Intersection	Core length (ft.)	U_3O_8(%)
1	S55° E	50°	72	32'-34'	2	0.060
				34'-38'	4	0.047
1A	S55° E	50°	352	20'-22'	2	0.016
				22'-24'	2	0.044
				24'-26'	2	0.049
				26'-28'	2	0.088
				82'-84'	2	0.017
				84'-88'	4	0.026
				88'-92'	4	0.046
				92'-96'	4	0.058
				96'-100'	4	0.083
				100'-102'	2	0.072
2	S80° E	65°	200			
3	S55° E	50°	298	2'-6'	4	0.034
				6'-10'	4	0.188
				10'-14'	4	0.163
				14'-18'	4	0.066
				18'-22'	4	0.207
				66'-70'	4	0.064
				70'-74'	4	0.064
				74'-78'	4	0.048
				78'-82'	4	0.070
				82'-86'	4	0.037
				86'-90'	4	0.022
				90'-94'	4	0.063
				94'-98'	4	0.105
				98'-102'	4	0.041
4	S55° E	50°	99			

Giant Yellowknife Mines Ltd. (TAT 1-8 claims)
(75-K-11; about 62° 43'20"N, 109° 10'W) (Copper)

This property is on Fairchild Point just north of the settlement of Reliance in the East Arm of Great Slave Lake. The low-grade copper showings were previously covered by the BOX claims. Cominco Ltd. investigated the BOX claims in 1959. The BOX claims lapsed while they were under option to Giant Yellowknife during the 1967 season and the property was restaked as the TAT group.

Geological mapping, trenching, and sampling was done by Giant Yellowknife between July 12-27, 1967.

The southeast part of the property is underlain by rocks of the Kahochella Formation and the northwest part by red and white sandstones of the Sosan Formation (Stockwell et al., 1968b). These two formations are separated by the Murky Fault which strikes about N55° E. Micaceous red sandstone is exposed on much of the property, and appears to be both underlain and overlain by white sandstone. The sandstones generally dip 10° to 15° southwest. The sandstones are intruded by diabase sills in several places.

The main mineralized zone on the property is a northeast-striking fault breccia and quartz-stockwork zone on claims TAT 1 and 3. The zone passes beneath the lake to the southwest. Most of the previous trenching on the property was on this zone. The copper mineralization is concentrated in the fault breccia but extends as a mineralized quartz-carbonate stockwork into the sandstones, particularly the red micaceous sandstone. In the southwest corner of the group chalcopyrite was found in stockwork veins in both white and red sandstone. The mineralized zone is also found on Maufelly Point, where claim TAT 5 is located.

The main zone was followed and mapped for a length of 2,500 feet on Fairchild Point. However, the stockwork can be traced further along its projection to the northeast and, as noted above, passes beneath the water of Great Slave Lake to the southwest. Assay results from trenches along the zone are presented below.

Trench	Footage	Au(oz./ton)	Ag(oz./ton)	Cu(%)	
2	0-17	0.01	nil	0.25	
5	0-12			0.32	)
	12-24			0.25	) 0.43%/50 ft.
	24-50			0.57	)
6	0-16			0.13	)
	16-29			0.13	) 0.25%/48 ft.
	29-48			0.38	)
7	0-20	tr.	nil	0.25	
8	0-16	tr.	nil	0.44	
9	0-18	tr.	tr.	0.71	
10	0-15	0.01	nil	0.19	
	15-23	0.03	nil	0.19	
11	0-13	tr.	tr.	0.27	
	13-26	tr.	tr.	0.27	
12	0-10	tr.	tr.	1.01	

It is obvious that this sampling indicated quite consistent, but low grade, mineralization. A combined sample consisting of chips taken every 10 feet across a width of 200 feet of micaceous red sandstone along the main zone assayed 0.13% Cu. This sampling was done to the southwest of trench No. 5 and the assay may be combined with the results for that trench to give indicated overall grades of nearly 0.20% Cu across 250 feet or about 0.23% Cu across a width of 150 feet.

The grade indicated by investigation of the property was considered too low even for large-scale mining and no further work was recommended.

Nahanni Mines Ltd. (GEM claims)
(75-K-11; about 62° 50'N, 109° 16'W) (Copper)

This property is on Maufelly Point and most of the claims were recorded in July, 1965. Surface work on several showings on the property during the 1965 season has been summarized by Thorpe (1966, p. 27). The showings consist of chalcopyrite which is disseminated or fills fractures in silicified dolomite, siltstone, and red and black shale.

A drilling program was carried out on the No. 2 or Shore showing, located on the north shore of Maufelly Point, in 1967 with the participation of Guggenheim Exploration, Cerro Corporation, and Homestake Mining. Chalcopyrite occurs as disseminations in silicified tan-coloured dolomite, as blebs and fracture fillings in brecciated red and black shale, and as massive veins and heavy disseminations in red siltstone. The mineralized zone was traced for a length of 1,350 feet in 1965.

Four holes totalling 1,414 feet were drilled along the showing, but the amount of mineralization intersected in the drilling was very disappointing. The property was visited on July 20, 1967, after the drill program had been completed. In hole G-1 fair chalcopyrite is present at a depth of 140 to 161 feet in red mudstone and siltstone. Hole G-3 intersected some chalcopyrite for a core length of 14 feet (210 to 224 feet) in grey argillite, and in fractures in red mudstone across the next 12 feet. Elsewhere in the core only minor chalcopyrite is present on fracture surfaces or in quartz stringers.

Hole No.	Intersection	Cu(%)	
G-1	38'-40.8'	1.0 (estimated)	
	141'-144'	0.84	)
	144'-148'	1.00	)
	148'-152.5'	0.30	)
	152.5'-157'	0.11	) 0.50%/31 ft.
	157'-160'	0.10	)
	160'-163.5'	0.30	)
	163.5'-172'	0.67	)
G-2	112'-117'	0.17	
	117'-123.5'	0.30	
G-3	185'-192.8'	0.50	
	224'-231'	0.19	
	231'-237'	0.68	
	274'-280'	0.11	)
	280'-288'	0.06	)
	288'-294'	0.16	)
	294'-302'	0.22	) 0.19%/47 ft.
	302'-309'	0.11	)
	309'-315'	0.31	)
	315'-321'	0.30	)
	321'-327'	0.74	)
	327'-334'	0.25	) 0.47%/19 ft.
	334'-340'	0.41	)
G-4	146'-150'	0.33	
	150'-154.5'	0.34	
	166'-169.5'	0.25	

The four drillholes tested a strike length of 1,000 feet. The assay results of this drilling are presented on the previous page. These copper values were considered too low to be of economic interest, and no further work was recommended on the property.

Slave Lake Copper Mines (ANN claims)
(75-K-11; about 62° 39'N, 109° 22'W) (Copper)

This property, at Meridian Lake within the East Arm of Great Slave Lake, was staked many years ago and has been investigated periodically. Two mineralized sections along the main zone were investigated by Giant Yellowknife Mines Ltd. in 1957 and by the Consolidated Mining and Smelting Co. in 1959.

Giant Yellowknife Mines investigated the "B-zone", the most westerly exposure of which is about 1,800 feet northeast of the most northerly part of Meridian Lake. The zone is exposed by 8 trenches along a strike distance of about 600 feet (Baragar, 1961) on claims ANN 1 and 2. The best assays from trenching indicated 0.83% Cu across 15 feet or 0.98% Cu across 11 feet. Seven drillholes totalling 748 feet gave an intersection of 0.62% Cu across 20 feet on claim ANN 1 and an intersection of 0.6% Cu/7 ft. and 0.4% Cu/47 ft. on claim ANN 2. According to Baragar the zone consists of a number of sub-parallel quartz-carbonate veins, ranging in width from about 1 inch to 3 feet, which strike about N 55° E parallel to the cleavage in red slates.

The "A-zone" is exposed for a length of 1,150 feet to the northeast of the "B-zone" following a covered interval of 1,500 feet, and was examined by the Consolidated Mining and Smelting Company of Canada Ltd. Five trenches were dug on the zone along a length of 800 feet. Chip samples by Baragar (1961) from the trench which appeared to have the best mineralization gave 1.23% Cu and 0.06 oz./ton Au across 12 feet or 0.78% Cu across 37 feet. The zone is a stockwork, about 20 to 120 feet wide, of quartz-carbonate veins which strikes about N 40° E. The average width of the stockwork is about 60 feet. Chalcopyrite and pyrite are present in the veins and disseminated in the country rock, which is almost entirely limestone and silicified limestone.

In 1956 G.M.X. Corporation carried out an evaluation of the Meridian Lake area properties for Slave Lake Copper Mines Ltd. Work was largely on copper showings, on the ROS group of claims, near the north shore of Meridian Lake and extending up to 3 1/2 miles west of the west end of the lake. It was concluded that mineralization was either in veins trending from the granodiorite, in sediments near the granodiorite contact, or associated with faults that are associated with the granodiorite stocks. All the showings that were trenched gave overall values of less than 1% copper. A total of 1,055 feet in 9 holes was drilled to test a mineralized zone on claim ROS 152 on the west shore of a small lake (approximately 62° 36'N, 109° 32'W). The best intersection was 4.4% Cu across 3 feet, but in general higher grade intersections of 1.74% Cu across 1 1/2 feet and 1.05% Cu across 3 feet were more typical.

Drilling on the property in 1967 was financed in part by New York interests. This drilling program started early in the spring and was suspended for a short period over break-up. The holes were drilled at 100 to 200 feet intervals and investigated both the A and B parts of the zone. The first drilling was on claims ANN 2 and 3, near and on the "A-zone". The core was logged by W. L. McDonald of Yellowknife. By the end of June drilling

had been started on the sixth hole in the program. The second hole was reported to have intersected copper mineralization over a width of 200 feet. The early drilling indicated some fair copper values, apparently at least of the order of 1% to 1 1/2% Cu.

A total of 2,915 feet was drilled in 10 holes. Holes 1 to 4 tested zone A and holes 6 to 8 were drilled on zone B, with the other holes located between these zones. All holes were inclined at 40 degrees and drilled in directions N35° W to N23° W. The locations of these holes are listed in the table below, and the assay results for a number of the holes are presented in the succeeding table.

The baseline for the grid had its origin on the shore of Meridian Lake about 600 feet southwest of the southwest boundary of claim ANN 1 (the claim boundaries are not oriented north-south and east-west). The baseline strikes approximately N48° E across claims 1, 2 and 3 and crosses claim ANN 1 about 250 feet northwest of its southeast boundary. A point on the baseline at about 54 + 00 E lies on the east boundary of claim ANN 3.

Hole	Grid Location North	East	Bearing	Depth (ft.)
1	49+10 N	3+80 E	337°	285
2	47+10 N	3+47 E	332°	307
3	45+10 N	3+10 E	329°	264
4	43+00 N	2+90 E	332°	242
5	35+85 N	1+75 E	325°	151
6	21+37 N	2+15 E	330°	305
7	19+20 N	1+80 E	337°	321
8	23+50 N	1+90 E	333°	464
9	34+90 N	1+95 E	332°	304
10	37+15 N	2+17 E	332°	272

Assay Results on Drill Core

Hole no.	Intersection	Core length(ft.)	Au(oz./ton)	Ag(oz./ton)	Cu(%)
3	48'-53'	5	tr.	0.02	0.25
	95'-100'	5	tr.	0.10	0.20
	100'-105'	5	0.01	tr.	0.25
	110'-115'	5	tr.	0.10	0.25
	115'-120'	5	tr.	tr.	0.10
	120'-125'	5	tr.	tr.	0.35
	125'-130'	5	tr.	nil	0.61
	130'-135'	5	0.01	tr.	0.45
	135'-140'	5	tr.	nil	0.66
	140'-145'	5	0.01	0.10	0.40
	145'-150'	5	tr.	nil	0.56
	150'-155'	5	nil	tr.	0.35
	155'-160'	5	tr.	tr.	0.56
4	92'-97'	5	0.02	nil	0.40
	97'-102'	5	0.02	0.22	0.20
	102'-107'	5	tr.	0.06	0.20
	107'-112'	5	tr.	nil	0.20

Hole no.	Intersection	Core length(ft.)	Au(oz./ton)	Ag(oz./ton)	Cu(%)
	112'-117'	5	nil	tr.	0.20
	117'-122'	5	nil	tr.	0.30
	122'-127'	5	0.02	tr.	0.30
	127'-132'	5	0.01	0.12	0.20
	132'-137'	5	0.04	0.22	0.86
	137'-142'	5	0.01	nil	0.61
	142'-147'	5	0.02	tr.	0.31
	147'-152'	5	tr.	0.08	0.10
	152'-157'	5	0.02	tr.	0.30
	157'-165'	8	0.01	tr.	0.20
	165'-170'	5	0.01	tr.	0.30
	170'-175'	5	0.02	0.10	0.20
	175'-180'	5	0.04	nil	0.40
	180'-185'	5	0.04	0.06	0.30
	185'-190'	5	0.02	0.04	0.20
	190'-195'	5	0.01	tr.	0.30
	195'-200'	5	tr.	0.10	0.20
	200'-205'	5	tr.	0.04	0.71
	205'-210'	5	0.02	0.24	0.40
5	19.5'-21'	1.5	0.01	0.08	0.81
	21'-23'	2		4.44	0.86
	23'-28'	5	0.01	0.38	0.25
	28'-34'	6	tr.	0.04	1.10
	34'-37'	3	0.08	0.58	1.02
	37'-41'	4	0.04	0.50	0.51
	41'-44'	3	tr.	0.70	0.61
	44'-49'	5	0.02	0.38	0.71
	49'-54'	5	tr.	0.22	0.51
	54'-59'	5	0.02	0.18	1.33
	59'-64'	5	0.01	0.38	0.51
	64'-69'	5	0.01	0.18	1.33
	69'-74'	5	0.04	0.16	0.20
	74'-79'	5	0.02	0.12	0.51
	79'-84'	5	0.32	72.38	0.71
	84'-89'	5	0.01	70.70	0.92
	89'-94'	5	0.01	0.18	0.51
	94'-99'	5	0.02	0.66	0.61
	103'-108'	5	0.01	1.02	0.61
	108'-113'	5	tr.	0.64	0.61
	113'-118'	5	0.02	0.54	0.61
6	228'-234'	6	0.10	0.02	0.51
	263'-268'	5	nil	0.10	0.56
	268'-272'	4	nil	0.14	0.30
	272'-277'	5	nil	0.04	0.05
	277'-282'	5	tr.	0.04	0.10
	282'-287'	5	nil	4.00	0.10
	287'-292'	5	tr.	0.24	0.10
8	95'-100'	5	0.04	0.10	0.61
	292'-293'	1	0.02	3.66	1.62
	350'-355'	5	nil	tr.	0.20

Hole no.	Intersection	Core length (ft.)	Au(oz./ton)	Ag(oz./ton)	Cu(%)
	371'-373'	2	tr.	tr.	0.61
9	23'-28'	5	0.01	0.10	0.45
	28'-33'	5	tr.	0.10	0.15
	33'-38'	5	tr.	tr.	1.11
	38'-43'	5	tr.	tr.	0.15
	43'-48'	5	nil	tr.	0.15
	48'-53'	5	nil	0.10	0.15
	53'-58'	5	nil	0.04	0.20
	58'-63'	5	0.01	0.10	0.45
	63'-68'	5	tr.	tr.	0.15
	68'-73'	5	0.01	0.10	0.40
	73'-78'	5	0.01	0.14	0.56
	78'-83'	5	tr.	tr.	0.30
	83'-88'	5	0.02	nil	0.40
	88'-93'	5	0.02	nil	0.40
	93'-98'	5	0.01	nil	0.61
	98'-103'	5	0.02	nil	0.40
	103'-108'	5	0.01	nil	0.51
	108'-113'	5	tr.	nil	0.40
	113'-118'	5	tr.	nil	0.30
	118'-123'	5	0.02	tr.	0.61
	123'-128'	5	tr.	nil	0.30
	128'-130'	2	nil	tr.	0.30
	251'-256'	5	0.01	nil	0.40
10	36'-39'	3	nil	nil	0.10
	39'-44'	5	nil	tr.	0.30
	44'-49'	5	nil	0.04	0.30
	63'-68'	5	nil	tr.	0.25
	76'-81'	5	0.01	nil	0.25
	90'-95'	5	0.04	nil	0.30
	95'-100'	5	tr.	nil	0.40
	100'-105'	5	nil	0.14	0.40
	105'-110'	5	tr.	0.04	0.51
	135'-140'	5	tr.	nil	0.61
	140'-145'	5	tr.	nil	0.35
	145'-150'	5	tr.	nil	0.35
	150'-155'	5	tr.	nil	0.30
	167'-172'	5	tr.	nil	0.40
	172'-178'	6	tr.	tr.	0.30
	178'-181'	3	0.01	nil	0.40
	202'-207'	5	0.02	nil	0.71

Nahanni Mines Ltd. (MARK claims)
(75-K-12; about 62° 34'N, 109° 37'W) (Copper)

This group of claims is located between McAteer and Kinsey Lakes about 17 miles southwest of Reliance. The group was recorded in July, 1965, to cover a number of areas of copper mineralization. These copper showings were investigated in 1965 and have been described by Thorpe (1966, p. 25).

An induced polarization survey was recommended by a consultant as a possible method of outlining the disseminated copper mineralization found on the property.

In 1966 the main work done by Nahanni Mines in the East Arm of Great Slave Lake was an induced polarization survey on the MARK property. This survey was done July 18 to September 6 and one main anomaly 500 by 4,000 feet was outlined. Five drillholes were recommended to test this anomaly and a single hole to test a second anomaly located one mile to the east (The Northern Miner, Feb. 16, 1967, p. 11). The main anomaly is located along the Murky Fault, which is only indirectly related to copper mineralization on the property. The induced polarization survey was conducted along north-south lines spaced 400 feet apart and an electrode separation of 200 feet was used. Background chargeabilities were found to be 3 to 5 milliseconds.

In 1967 a drilling program was carried out on the MARK and GEM groups in the East Arm area with the participation of Guggenheim Exploration, Cerro Corporation, and Homestake Mining. These participating companies were committed to spend at least $45,000 to cover work including 3,500 feet of drilling on the two groups.

On the MARK property one hole was drilled across a 12 millisecond peak on the main induced polarization anomaly. This hole had only reached a depth of about 215 feet at the time the property was visited on July 20, 1967. At that time the hole had passed through grey argillite, siltstone, and limestone with grey argillite partings, but had not intersected any copper mineralization.

A second hole was planned, 800 feet to the west, to test the widest part of the anomaly where it had a peak of 15 milliseconds. The induced polarization anomaly is an irregular feature closely associated with the Murky Fault and is in the vicinity of the Delta zone (Thorpe, 1966, p. 25). A third hole was planned to cross both the fault and the west end of the Delta zone.

Hole M-1 was collared on claim MARK 13 near the shore of a small lake and was inclined at 45 degrees in the direction S30° E. The hole was drilled to a depth of 754 feet and passed onto claim MARK 14. Hole M-3, 550 feet in depth, was collared on the latter claim and was drilled on the same section line, in the same direction, and with the same inclination as hole M-1. This hole passed beneath the Delta zone but also failed to intersect any mineralization.

Hole M-2 was collared near the north boundary of claim MARK 10 and was drilled due south at an inclination of 46 degrees. This hole went to a depth of 410 feet and presumably tested an induced polarization anomaly located one mile east of the main anomaly. Hole M-4 was located in the southeast corner of claim MARK 14 and was drilled at an inclination of 45 degrees in the direction S15° E to pass onto claim MARK 9. This hole was drilled to a depth of 390 feet and tested a breccia zone located near the Cryptic showing. Only traces of copper mineralization occur in core from the hole.

In spite of the poor drill results, the property was considered to warrant further work. Additional detailed geological mapping and geophysical surveying were recommended. Further drilling of the Delta zone and of an anomaly located about 2,000 feet east of hole M-1 was also recommended.

Polaris Mines Ltd. (GIB 1-54 claims)
(75-L-15; about 62° 56'N, 110° 37'30"W) (Copper)

This property is located just east of Thompson Landing on the north shore of the East Arm of Great Slave Lake. Magnetometer and electromagnetic surveys were conducted during the 1967 season. Grab samples from pits on the property assayed as high as 26.4 per cent copper. A subsequent drill program resulted in erratic mineralized intersections. The work program was carried out under the supervision of K. L. Christie, consulting engineer. The copper mineralization is located in east-west zones in an area of metamorphosed sediments.

Two small electromagnetic grids were established on claims GIB 3 and GIB 8 to test showings 01 and 02, respectively. The survey on the 01 showing was done with a line spacing of 50 feet and station intervals of 25 feet. A small anomaly with a strike length of 450 feet was detected. A small anomaly 300 feet long was outlined on the 02 grid. The survey work on these two grids totalled less than 1 line mile.

About 2.2 line miles of survey were done on the 03 grid on claims GIB 13-15, 26 and 28-31. No conductors were detected on this grid. Grid 04 was located toward the east end of the property on claims GIB 2, 3 and 19-24. The survey on this grid covered just over 4 line miles. Two or three parallel linears trend north-south on the grid. Two weak, narrow, and short conductors were located on the south part of the grid, and a stronger narrow conductor was located on the north part. A hole was drilled to a depth of 145 feet at an inclination of 30 degrees to test the latter anomaly, but only a trace of copper mineralization was intersected.

It was reported (Western Miner, Oct. 1967, p. 70) that a series of seven parallel copper-bearing veins from 2 inches to 3 feet in width had been traced for a length of 120 feet by drilling. The veins are contained within a zone 33 feet wide and the two largest veins were estimated to grade 10 per cent Cu. The assay results from the drill core were subsequently reported (The Northern Miner, Nov. 23, 1967, p. 10), and are presented in the table below.

Hole No.	Intersection	Core length(ft.)	Ag(oz./ton)	Au(oz./ton)	Cu(%)
01-1	38.5'-42.5'	4			2.9
02-1	32.5'-34.0'	1.5	0.10	tr.	5.58
	35.5'-38.5'	3	tr.	tr.	12.8
02-1A	23' -28'	5	0.35	tr.	3.30
02-2A	10' -17'	7	0.50	0.02	13.05
02-3	23.6'-65.0'	41.4	0.15	0.01	5.55

Hole 01-1 was drilled at an inclination of 30 degrees to intersect the projection of mineralization in an old pit. This hole tested the 01 zone on claim GIB 3. The remaining holes tested the 02 zone which is located on claim GIB 8 and approximately 1/2 mile southwest of the 01 zone. The mineralized zone dips toward Great Slave Lake. A drilling contract was arranged for 1,000 feet of drilling early in the 1968 season to test the extension of the zone beneath the lake.

The first two holes in this program were drilled from the ice on the lake at about 100 feet from the shore. The holes were inclined northerly,

hole No. 2 was inclined at 45 degrees. Hole No. 3 was located 50 feet from the shore and 250 feet northwest of No. 2. This hole was drilled in a north-northeast direction to test a fault zone with a northwest-southeast strike. The 01 mineralized zone was tested by hole No. 4 which was located 3,250 feet northeast of hole No. 3. At least holes No. 2 and 3 intersected mineralized zones, but the assay results are not known.

International Mine Services (SK 1-108 claims)
(75-L-15, 75-M-2; about 63° 00'45"N, 110° 46'45"W) (Copper)

This property is at Susu Lake approximately 7 miles southeast of Indian Mountain Lake. During the 1966 season a small belt of volcanic rocks was investigated here by International Mine Services. The rocks forming the volcanic belt are largely rhyolite. The property was visited by the author on July 9, 1966.

On the west shore of the lake a pyrite-rich zone has been exposed by trenching. Extremely minor amounts of sphalerite are also present along the zone which strikes north-south parallel to the attitude of the rhyolite. Just to the east there is a cobalt-bearing zone in a narrow band of basic volcanics. The mineralization is in an east-west fracture zone and consists of minor chalcopyrite, gersdorffite and/or alloclasite.

A copper showing about 1/2 mile west of the lake was trenched, and 9 shallow holes were subsequently drilled beneath the main mineralized portion of the zone. The copper-bearing zone is a sheared and brecciated zone in rhyolite. In addition to chalcopyrite some calcite, quartz and ferrodolomite are found cementing the brecciated rock. Although there is good copper mineralization in some parts of the zone, the overall grade is low.

The drilling was done in August and September 1966 with results as presented in the table below. The first eight of the holes were drilled on claim SK 59, at about 63° 00'40"N and 110° 47'30"W.

On the basis of the drill program the copper-bearing zone was estimated to contain 142,500 tons grading 0.95% Cu within a strike length of 400 feet and to a depth of 175 feet (Survey of Mines 1968, The Financial Post).

Hole No.	Intersection	Core length(ft.)	Cu(%)	
1	65'-71'	6	0.49	
	71'-80'	9	2.26	
	80'-94'	14	0.43	1.56% / 37 ft.
	94'-96'	2	3.35	
	96'-100'	4	0.13	
	100'-102'	2	12.25	
	102'-105'	3	0.16	
2	47'-50'	3	0.17	
	50'-61.5'	11.5	0.43	0.66% / 20 ft.
	61.5'-70'	8.5	0.96	
4	53'-66'	13	0.34	
	66'-71.5'	5.5	3.59	1.10% / 24 ft.
	71.5'-77'	5.5	0.42	

Hole No.	Intersection	Core length(ft.)	Cu(%)			
5	198.5'-202'	3.5	0.30			
	202'-204'	2	0.09			
	204'-206'	2	0.99			
	206'-211'	5	0.17			
	211'-214'	3	0.19			
	214'-216'	2	6.46			
	216'-219'	3	0.65			
	219'-228'	9	1.31	1.49% / 25 ft.		
	228'-230'	2	0.55			
	230'-234'	4	1.01			
	234'-239'	5	1.11			
	239'-242'	3	0.24		1.20% / 36 ft.	
	242'-248'	6	0.06			
	248'-250'	2	2.30			1.01% / 46 ft.
	250'-255'	5	0.22			
6	174'-178'	4	0.68			
	178'-180.5'	2.5	0.11			
	180.5'-186'	5.5	0.60			
	186'-189'	3	0.41			
	189'-191.5'	2.5	0.22			
	191.5'-196'	4.5	0.60			
	245'-247'	2	4.35			
	262'-269'	7	1.08			
7	169.5'-173'	3.5	0.45			
	173'-175.5'	2.5	0.23			
	175.5'-178'	2.5	1.89	1.02% / 19.5 ft.		
	178'-180.5'	2.5	0.05			
	180.5'-184'	3.5	3.12			
	184'-189'	5	0.39			
	189'-194'	5	0.16			
8	113'-119'	6	0.09			
	119'-120.5'	1.5	1.27			
	120.5'-125.5'	5	0.11			
	125.5'-138'	12.5	0.05			
	138'-143'	5	0.16			
	143'-145'	2	1.92			
	145'-151'	6	0.12			

International Mine Services (BB claims)
(75-M-2; about 63° 02'45"N, 110° 56'55"W) (Lead, Zinc, Silver, Copper)

This property in the Indian Mountain Lake area was first staked in 1948 and was optioned to Hollinger Gold Mines in November of that year. This company carried out a diamond-drilling program during the following year. A total of 15,825 feet of diamond drilling resulted in defining 271,000 tons of ore averaging 15.68% Zn, 1.67% Pb and 5.21 oz./ton Ag down to a depth of 400 feet.

The mineralization consists of iron-rich sphalerite, pyrite, galena, and minor chalcopyrite with quartz gangue. The ore has been recrystallized by metamorphism and the development of porphyroblastic pyrite grains is a striking feature of its texture. The deposit is a generally conformable lens in quartzite and garnet-bearing quartz-biotite gneiss. The deposit is localized in an S-shaped dragfold which disrupts the northwest-southeast strike of the metasediments. The dragfold plunges north at 45 degrees. The mineralized zone has true widths of up to more than 60 feet and, in general, has a horizontal extent of not more than 200 feet.

Further work was done on the deposits during the 1952 season by Joe Indian Metal Mines Ltd. More than 7,000 feet of EX drilling and 450 feet of X-ray drilling was done during the season and resulted in revision of the estimate of indicated ore upwards to 924,000 tons grading 10.3% Zn, 0.85% Pb and 2.45 oz./ton Ag. This tonnage was located above the 650 feet horizon at which depth the orebody was found to be displaced by a fault striking about 110 degrees and dipping steeply north. The orebody was intersected again at a depth of 800 feet and the apparent displacement of the block north of the fault is 150 feet to the east and 120 feet downwards. The orebody is also transected by two northeasterly striking faults which show small displacements. The X-ray drilling indicated some extension of the mineralization to the west. Plans were under consideration for underground development and mill construction for 1953, but were not implemented.

Work by International Mine Services in the area in 1965 consisted of extensive electromagnetic and magnetometer surveys and was aimed at a relatively exhaustive re-examination of the entire volcanic belt. This program included some diamond drilling to test geophysical anomalies and was summarized by Thorpe (1966, p. 21). This work was done for Indian Mountain Metal Mines Ltd., Snowdrift Base Metal Mines Ltd., Prima Mining and Metal Company Ltd., Consolidated Marbenor Mines Ltd., and Murky Fault Metal Mines Ltd. The BB claims form part of the property of Indian Mountain Metal Mines Ltd.

International Mine Services was ready to recommence drilling in the area by mid-March 1966. Some of this drilling was done on an anomaly that was outlined in 1965 in association with a known massive sulphide zone beneath Kennedy Lake. Kennedy Lake is a very small body of water just northwest of the BB orebody. This drilling indicated that the massive sulphide zone was 120 feet long and up to a maximum of 21 feet wide. This zone is estimated to contain 70,000 tons grading 6.15% Zn, 1.40% Pb and 5.30 oz./ton Ag to a depth of 250 feet (Survey of Mines 1968, The Financial Post). The ore is similar in all essential respects to that of the BB deposit.

Considerable pyrite is present as discrete clean-looking crystals in a sphalerite-quartz matrix, an identical metamorphic texture to that of the BB ore. The ore zone is apparently located near the top of a band of volcanics. Below the band of massive sulphides, pyrite and pyrrhotite, and some associated chalcopyrite, are found within the volcanics.

The drilling to outline the Kennedy Lake deposit intersected a zone of low-grade disseminated chalcopyrite mineralization beneath the lake with widths of up to 120 feet. This zone of mineralization apparently produced a broad geophysical anomaly when the area was surveyed in 1965. The assay results indicate a grade of less than 1% Cu. The chalcopyrite is present as streaks roughly paralleling the bedding, and in part filling fine cross fractures, in highly metamorphosed metasediments. Coarse garnet and biotite are

abundant constituents except in the most quartz-rich bands. The zone has been estimated to contain 1,000,000 tons grading 0.90% Cu over a length of 835 feet (Survey of Mines 1968, The Financial Post).

A few deep holes, to a depth of about 1,000 feet, were drilled on the BB zone. This drilling, apparently due to the complexity caused by faulting, resulted in only one good ore intersection and thus failed to increase the estimated tonnage of the deposit.

In 1967 a small project consisting of detailed geological mapping was carried out in the vicinity of Kennedy Lake. The work was directed toward tracing the zone of copper mineralization noted above. As a result of the mapping it was considered that the zone could be traced, with little displacement, northward to BB Lake. The work uncovered some further chalcopyrite mineralization, but nothing of significant grade or size.

YELLOWKNIFE - GORDON LAKE - MacKAY LAKE AREA

Exploration in this area included the re-investigation of a number of gold showings in the volcanics of the Yellowknife Greenstone Belt. Gold showings in the sediments of the Yellowknife Group at a number of locations somewhat east of the belt of volcanic rocks were also re-investigated, as were other gold showings in volcanics of the Yellowknife Group at Spencer and Sunset Lakes.

The volcanic-sedimentary belts of Yellowknife Group rocks in the southern part of the Slave structural province were also investigated for base metal possibilities. This exploration was directed toward finding massive sulphide deposits of the Noranda copper-zinc type or of the zinc-lead-silver-copper type, which may be represented by the deposit at Indian Mountain Lake. As part of this exploration effort silver-bearing zinc-lead showings at Homer and Victory Lakes were re-investigated. Exploration in the Rivett Lake-Camsell Lake area was concentrated along the contacts between volcanics and sediments.

In addition to the exploration for gold and base metals, the pegmatites in the Upper Ross Lake area were examined again with regard to their tantalum content, and some work was done on a copper showing in the same area.

Kamcon Mines Ltd. (AYE claims)
(85-J-8; about 62° 27'40"N, 114° 24'20"W)

This property is just west of Yellowknife. A magnetometer survey was conducted on the property May 9 to 19, 1966, to investigate an aeromagnetic anomaly at the west end of Stock Lake. This anomaly is in the southeast corner of claim AYE 11 and extends south of west across the south boundary of the claim onto claim AYE 18.

Pillowed to massive, metamorphosed, andesite and basalt cover all or parts of claims AYE 10-12, 15-19, 28 and 29 (Henderson and Brown, 1948). The survey was done on north-south lines spaced 200 feet apart with readings being taken each 100 feet, and more closely in the vicinity of the anomaly. The survey partly delineated two parallel conformable magnetic bodies occuring within a width of 100 to 200 feet. It was considered that the anomalous

response for the stronger zone could be due to a source containing 10 per cent magnetite or about 35 per cent pyrrhotite. The depth of the causative source was calculated to be 60 to 110 feet.

A Turam survey and a 350-foot drillhole were recommended to further investigate the magnetic anomalies.

Mate Yellowknife Gold Mines Ltd. (KIM 1-4 claims)
(85-J-8; about 62° 30'35"N, 114° 19'30"W)

This property, in the Yellowknife greenstone belt, adjoins to the north of the property of Lolor Mines (see Giant Yellowknife Mines). Deep diamond drilling by the company in 1950 located shear zones that were described as of the "Giant" type.

A budget of $12,000 was authorized for the drilling of two deep holes in 1967 (The Northern Miner, Nov. 24, 1966, p. 101). These holes were drilled in May and June, 1967, on the north part of the KIM 2 claim. The holes totalled 1,896 feet and tested the extension of the GB structure from the Lolor property. The zone was found to dip approximately 50 degrees southwest. It was considered that the amount of sericite alteration, quartz-carbonate veining and sulphide mineralization in the schist zone was less in these holes than in productive areas of the zone.

This drill program was conducted by Giant Yellowknife Mines and was tied in with detailed surface mapping and compilation of underground data over the preceding three years by Ken Polk for the Giant-Supercrest-Northbelt interests. As of the end of 1968 Giant Yellowknife was reported to hold a 38.5 per cent share interest in Mate Yellowknife Gold Mines.

Fenix Mines Ltd. (PC 1-48 claims)
(85-J-9; about 62° 39'15"N, 114° 17'50"W) (Lead, Zinc, Silver)

This property is located at Homer Lake, about 15 miles north of Yellowknife. The property was first staked as the HOMER group in September, 1933 (Lord, 1951, p. 177). Jolliffe (1938) gave some description of the geology and early trenching work on the property.

A quartz-porphyry dyke about 100 feet wide strikes northeast through volcanic rocks of the Yellowknife Group. Many of the small lead-zinc-silver lenses that were investigated at an early date were located near and on either side of this dyke which is exposed for a length of 800 feet. Two samples from early trenches on the property are reported to have assayed 2.14 oz./ton Ag across 2 feet and 10.8 oz./ton Ag across 6 1/2 feet. Other lead-zinc replacement deposits on the property were reported to carry higher values in precious metals (Jolliffe, 1938).

Claims PC 1-12 were recorded April 25, 1960 and claims PC 13-48 on June 28, 1966. Ten holes totalling 370 feet were drilled in 1960 and 1961 and indicated good sulphide mineralization over widths of up to 16 feet. An additional 6 holes totalling 226 feet were drilled in 1963.

Further shallow drilling was done on the property during the 1966 season. In combination with the previous trenching and drilling, this tested the No. 1 zone for a length of 700 feet. The average for 11 holes that tested a length of 500 feet is 2.81 oz./ton Ag, 3.61% Pb, 1.79% Zn, 0.14% Cu and

0.09 oz./ton Au across an average width of 8 feet. This indicates a potential approaching 600 tons of ore per vertical foot worth a gross value of about $25 per ton.

The No. 3 zone lies 600 feet northeast of the No. 1 zone and is considered to be its strike extension. Five trenches along a length of 200 feet indicated a grade of 2.19 oz./ton Ag, 1.79% Cu, 3.01% Pb, 1.10% Zn, and 0.06 oz./ton Au across an average width of 4.4 feet.

The 1A and 1B zones closely parallel the No. 1 zone and have each been tested by trenching and a single drillhole. The work on 1A zone has indicated an average grade of 1.45 oz./ton Ag, 2.76% Pb, 3.49% Zn, 0.10% Cu, and 0.01 oz./ton Au for a length of 300 feet and a width of 8 feet. The 1B zone has been investigated over a length of 250 feet and has an average grade of 1.62 oz./ton Ag, 3.10% Pb, 4.70% Zn, 0.14% Cu and 0.02 oz./ton Au.

It was reported (The Northern Miner, Aug. 11, 1966, p. 13) that a contract had been arranged early in July for the drilling of an additional 1,500 feet on the property. It is not known whether or not this drilling was done.

Two samples of ore were submitted to the Mines Branch, Ottawa, for investigation. Assay results for these samples were as follows (Owens, 1967):

	Pb(%)	Zn(%)	Ag(oz./ton)	Au(oz./ton)
Zone No. 1	4.16	4.32	2.27	0.02
Zone No. 3	4.32	3.66	3.00	0.04

A mineralogical investigation of the ore (Owens, 1967) indicated that it consists primarily of sphalerite, galena, marcasite, arsenopyrite and pyrite. Minerals identified in minor amounts included chalcopyrite, pyrrhotite, tetrahedrite, ilmenite and magnetite. The gangue minerals are chiefly quartz and chlorite, but include small amounts of siderite and dolomite. It appears that each ore mineral, with few exceptions, contains inclusions of the other metallic minerals. Sphalerite is reported to form intimate intergrowths with galena, pyrite, arsenopyrite and gangue. These textural relationships suggest that the ore may have been recrystallized by metamorphism or structural deformation. The tetrahedrite was found to be in grains 10 to 50 microns in diameter included in chalcopyrite. X-ray diffraction patterns indicated that the mineral might be argentiferous, but this was not verified.

Giant Yellowknife Mines Ltd. (TIN 10, 11 claims)
(85-J-9; about 62° 32'35"N, 114° 10'25"W) (Gold)

This property was investigated by drilling by Tarbell Mines in 1955. The best assay values obtained from surface trenching on the property was apparently 0.5 oz./ton to 0.7 oz./ton Au. The drilling was concentrated on the TIN 10 claim and followed the main surface showing for 700 feet down the plunge to the northwest. A total of 6,603 feet in 16 holes was drilled. The best intersections obtained in the drilling were 0.76 oz./ton Au and 4.4% Zn across a width of 1.6 feet; 0.60 oz./ton Au, 0.12% Zn and 2.4% Pb across a width of 4 feet; and 0.94 oz./ton Au and 26.2% Zn across a width of 0.7 foot.

Detailed geological mapping of claims TIN 10 and 11 was done for Giant Yellowknife Mines between June 6-27, 1967. The claims are underlain by garnet-bearing nodular and non-nodular metasediments of the Yellowknife Group. The metasediments have been folded into tight northwest-plunging folds and cut by northwest- and northeast-striking sets of faults.

A lens of nearly massive sphalerite occurs in a tight northwest-plunging syncline. Good gold values, including some visible gold, are associated with the sphalerite. Quartz, and some pyrrhotite and pyrite, also form part of the mineralization of the zone. The mineralization appears to be a replacement, at least in part, of highly schistose rock along a fault. The fault conforms in part with the bedding in the metasediments.

Giant Yellowknife Mines Ltd. (PJ 1-15 claims)
(85-J-16; about 62° 51'30"N, 114° 18'W) (Gold)

This property is located about 28 miles north of Yellowknife and was staked by the company in 1964. Geological mapping at 400 feet to the inch was done on the property in 1965 (Thorpe, 1966). The property is underlain by volcanics and sediments of the Yellowknife Group, and a wide sericite-chlorite schist alteration zone was found to extend north-south across claims PJ 2 and 5.

Two holes totalling 964 feet were drilled March 26 to April 6, 1966, on claim PJ 5 to test the alteration zone. Hole No. 1 was collared about 600 feet north-northwest of the southeast corner of the claim and hole No. 2 was collared 470 feet north of hole No. 1. Both holes were inclined at 45 degrees to the west. Hole No. 1 was predominantly in altered tuffaceous volcanic rocks and intersected chlorite-sericite schist for a core length of 15 feet. Hole No. 2 penetrated 225 feet of gabbro before entering pyrite- and pyrrhotite-bearing black slate, followed by chlorite schist. A core length of 25 feet was estimated to contain 50 to 80 per cent pyrrhotite. None of the samples from the core assayed greater than 0.01 oz./ton Au.

Shield Resources Ltd. (NOSE 1-40 claims)
(85-J-16; about 62° 54'50"N, 114° 14'W) (Gold)

This property was staked in 1964 to cover a new gold discovery. The general geology of the property and the nature of the showings has been described by Schiller (1965, p. 10). Diamond drilling and other work on the property in 1965 was summarized by Thorpe (1966, p. 14). The 1965 program indicated a grade of 1.08 oz./ton Au across a width of 11 feet and for a length of 70 feet in the No. 1 zone.

In late January or early February, 1967, an open-cut mining operation was started on the property. The objective was to obtain a large bulk sample for milling at Discovery Mine that would provide, possibly at a slight profit, a conclusive indication of the grade of the showing. Face sampling and muck sampling during the trenching indicated an average grade of about 0.43 oz./ton Au. In total about 1,140 tons of ore were mined, mechanically loaded, and trucked to Discovery Mine on the winter road.

The ore was milled by Discovery Mines early in July with a recovery of about 515 or 520 ounces of gold and 115 ounces of silver. The recovered

grade of about 0.45 oz./ton Au was in close agreement with that calculated from the assay results on samples taken during mining. The relatively low grade was at least partly due to high dilution as a consequence of winter mining in the open. There are no plans for further work on the property.

Giant Yellowknife Mines Ltd. (JES 1-9 and PAT claims)
(85-O-1; about 63° 01'30"N, 114° 14'W) (Gold)

This property at Johnston Lake was held under option by the company from J. E. Stevens. Geological mapping and sampling were carried out on the property during the 1965 season. The results of this work have been summarized by Thorpe (1966, p. 16). A drill program initiated on the property during January, 1966 was carried out on the basis of structural interpretation of the results of the detailed mapping. The program consisted of 5 holes totalling 2,484 feet and was completed by the end of March. The data concerning this drilling are recorded in the table below.

Hole	Inclination	Depth(ft.)	Claim and location	Target
1	45° E	488	Central part JES 1	Hill Vein
2	45° E	508	Near N boundary JES 2	Junction of a vein with Cross Vein
3	45° W	500	JES 2	Junction Cross and Ridge Veins
4	45° E	388	Near E boundary JES 5	Ridge Vein
5	45° E	600	Across boundary PAT 10 and 7	No. 1 showing, South Zone

Holes 2 and 3 were drilled to intersect the Cross Vein near its junction with a vein, exposed about 270 feet northeast of the Cross Vein, striking more nearly north-south, and with the northward projection of the Ridge Vein. As expected, the holes all intersected greywacke and slate. Several breccia zones cemented by quartz were encountered, but assay results were generally not higher than 0.18 oz./ton Au. However, one sample taken from a pyrrhotite-galena vein 7 inches wide in hole 4 did assay 1.70 oz./ton Au and 1.42 oz./ton Ag. The drilling failed to reveal anything that was considered to warrant further investigation.

Viking Yellowknife Gold Mines Ltd. (01a and BBB claims)
(85-O-1; about 63° 06'19"N, 114° 03'22"W) (Gold)

This property was staked in the spring of 1945 and was subsequently optioned by Athona Mines (1937) Ltd. Extensive rock trenching and about 13,600 feet of diamond drilling were done in 1946 and early 1947 (Lord, 1951, p. 293). Viking Yellowknife Gold Mines was formed in May, 1947, to continue development of the property.

The trenching and drilling was almost restricted to the Main zone on the 01a 9 and BBB1 claims, but a little work was done on the East zone on claim BBB4. A shaft, started in April, 1947, was sunk to a depth of 160 feet

on the Main zone. The shaft is inclined 65 degrees in the direction N35° E. Several hundred feet of drifting and cross-cutting was reported to have been done on a level established at a depth of 150 feet (Lord, 1951, p. 294).

The Main zone consists of a quartz diorite sill in sediments of the Yellowknife Group. The sill strikes about N35° E and dips 80 degrees southeast. This sill is about 15 to 60 feet thick and was traced in outcrop and by drilling for a length of 2,900 feet. The quartz diorite is cut, particularly near its contacts, by numerous quartz bodies. The drilling disclosed widely distributed gold-bearing intersections some of which were of ore grade. The northern exposed part of the sill, particularly along the footwall, yielded particularly promising samples for a length of 570 feet.

Early in 1968 the property was optioned by Discovery Mines Ltd. (The Northern Miner, Oct. 3, 1968, p. 18) who is obliged under the agreement to carry out sufficient work on the 33-claim property to maintain it in good standing until April 3, 1973. It was reported that the ore potential of the property had been calculated at 700 tons per vertical foot at an estimated grade of 0.6 oz./ton gold. An increase in the price of gold was considered necessary before consideration could be given to possible production.

Hidden Lake Mines (HM claims)
(85-I-12; 62° 33'20"N; 113° 30'45"W) (Gold)

This old property is located on the northeast side of Hidden Lake 28 miles east-northeast of Yellowknife. The property was restaked in June, 1959, by J. Herriman. Subsequently the claims were acquired by F. Avery, Yellowknife. The property has been described by Schiller (1965, p. 21). Gold and associated sulphides are found, in particular, rimming and in a large quartz boudin about 20 feet wide, 30 feet thick, and more than 50 feet long. The boudin strikes east and plunges parallel to the bedding, which varies from N40° E at the surface to N30° E in the mine. Some associated smaller quartz boudins are also mineralized and are apparently within the same horizon. A shaft, inclined at 80 degrees, has been sunk to a depth of 10 feet and about 145 feet of drifting has been done.

In early 1967, Mr. Avery planned, through First Northern Exploration, to set up a small mill on the property. A drill for small-diameter core was first operated on the property in an attempt to intersect some shoots warranting mining.

During the winter of 1967-1968 a winter road was established to the property and work was done in the mine by F. Avery and his two sons.

Late in the 1968 season a program of detailed underground sampling of the workings was conducted by Precambrian Mining Services Ltd. The results were reported to have been encouraging.

International Bibis Tin Mines-CIBA Limited (PEG 1-48 claims)
(85-I-11; about 62° 44'30"N, 113° 07'W) (Tantalum)

The 14-claim PEG property of Peg Tantalum Mines in the Upper Ross Lake area was purchased during 1966 by Barrington Explorations. The property was subsequently optioned by International Bibis Tin Mines and the latter company entered into an evaluation agreement with CIBA Limited, a

Switzerland-based world-wide pharmaceutical and chemical organization, whereby the latter company could earn a 50 per cent interest in the property through expenditure of $200,000. Thirty-four additional claims were staked jointly by CIBA and International Bibis, and exploration on these was also to be on a joint basis. Precambrian Mining Services was contracted to carry out a work program in the area.

Interest in the property was sparked by a rise in the price of tantalum to above $12 per pound tantalum contained in concentrates. The tantalum-bearing pegmatites of the area were discovered by the Geological Survey of Canada in the summer of 1943. A small mill was operated intermittently by Peg Tantalum Mines on the property between October 1946, and July 1947, during which period about 940 tons were milled with a recovery of 3,750 pounds of concentrate (Lord, 1951, p. 231). Jolliffe (1944) estimated that, to a depth of 40 feet, the No. 1 dyke on the property contained 1,500 tons of material containing 13,500 pounds of recoverable concentrate averaging about 75% Ta_2O_5. Only a negligible amount of this material has been mined. The No. 3 dyke is much larger in size but the grade is not known, although it is much lower than in the main shoot of the No. 1 dyke. The No. 3 dyke is exposed over a length of 200 feet and passes beneath overburden at either end. Apparently 900 to 1,000 tons were mined from this dyke by Peg Tantalum Mines.

The main tantalum-bearing mineral in the pegmatite dykes of the Upper Ross Lake area is tapiolite (Hutchinson, 1955, p. 17). The mineral is a tetragonal polymorph of tantalite and has a tantalum content of 65-70 per cent. Beryl is quite abundant in pegmatites of the area and may be of some economic interest. Spodumene is present in a separate zone of pegmatites farther from the granite contact. Minor tin is also known in the area. A sample submitted to the Mines Branch in 1944 assayed 0.41% Sn. Following investigation of the tin possibilities by the Geological Survey of Canada it was reported that "preliminary field examination suggests that the best tin-bearing shoot is 400 feet long and averages 18 inches wide".

Work planned for 1967 included detailed mapping, bulk sampling employing a portable crushing plant, close-spaced drilling to shallow depths, and metallurgical and feasibility studies. Details of the 1967 program are not known, but sampling of the dykes indicated that they were generally lower in grade than anticipated and further studies were not deemed to be justified. The grade indicated by bulk sampling, apparently all done elsewhere than along the main mineralized section of the No. 1 dyke, was generally from a trace to 0.01% Ta_2O_5.

Polaris Mines Ltd. (BURL 1-12 claims)
(85-I-11; about 62° 44'10"N, 113° 05'W) (Copper)

This claim group is located in the Upper Ross Lake area. The property was investigated during the 1967 season under the supervision of K. L. Christie. Some drilling was done to test copper mineralization reported to occur along a length of 4,000 feet (The Northern Miner, September 14, 1967, p. 7). The drill results were reported to be disappointing (The Northern Miner, December 7, 1967, p. 13).

This property is adjacent to the PEG group which was investigated by International Bibis Tin Mines in 1967. A total of 80 pegmatite dykes were

reported to occur on the BURL property. More than half of these were apparently investigated in 1967, and most were reported to contain beryl and tantalite.

The main copper-bearing zone is reported to be 4,000 feet long by 10 to 30 feet wide. The zone is located at approximately 62° 44'30"N and 113° 05'55"W, and trends about N30° W across claims BURL 1 and 6. A channel sample across a width of 8 feet on the zone assayed 1.96% Cu. A grab sample from the zone was reported to have assayed 11.8% Cu. The drilling done on the zone in 1967 consisted of nine holes totalling 446 feet. Holes 1-5 were drilled on claim BURL 1, hole 7 on the boundary between claims BURL 1 and 6, and holes 8-10 at the southeast corner of claim BURL 6. Holes 9 and 10 were not sampled, but the assay results for the other holes are given in the table below.

Hole No.	Length (ft.)	Intersection	Core length(ft.)	Ag (oz./ton)	Au (oz./ton)	Cu(%)
1	40	23.5'-25.5'	2	nil	tr.	0.20
2	45	32.5'-34.5'	2	nil	tr.	0.20
3	40	23.0'-24.0'	1	0.06	0.02	1.70
4	45	28.5'-30.5'	2	nil	tr.	0.80
5	60	52.0'-53.0'	1	0.92	tr.	2.50
7	70	37.5'-39.0'	1.5	tr.	tr.	1.30
8	65	38.5'-40.5'	2	0.04	tr.	1.40

The assay results were considered to be too low to warrant further exploration on the property.

Victory Lake Mines Ltd. (LEN, LIM, HAZ, and IT claims)
(85-I-10, 11; about 62° 39'20"N, 113° 02'30"W) (Lead, Silver, Zinc)

This property at Victory Lake was in part formerly held by the Consolidated Mining and Smelting Company of Canada as the ROSS group. A total of 1,652 feet of drilling in 9 holes was recorded by Consolidated Mining and Smelting as assessment work in 1955. The best intersections obtained in this drilling were as follows:

Width(ft.)	Au(oz./ton)	Ag(oz./ton)	Pb(%)	Zn(%)
20.2	0.02	1.23	2.2	1.17
2.6	0.16	3.3	5.0	2.7
4.0	0.02	0.6	1.6	0.9

A drillhole by Consolidated Mining and Smelting in 1956 gave an intersection of 36 feet which assayed 3% Pb and Zn and 1 oz./ton Ag.

The TIN 3-21 and LEN groups, totalling 71 claims, were staked by Precambrian Mining Services in April, 1966. Claims IT 1, 2, 12-15, LIM 5, 6, HAZ 5, 6, and additional LEN claims were subsequently recorded. Victory Lake Mines was formed to finance an exploration program on this property. In January, 1967, claims LEN 1-112, LIM 5, 6, HAZ 5, 6, IT 1, 2 and 12-15 were transferred to the company.

The property was visited by the author on August 12, 1966, when a considerable number of trenches along the main zone were examined. The zone is exposed around the nose of an isoclinal fold, probably an anticline, on claims LEN 24, 25 and 26. The general zone of mineralization then extends southeast within the rhyolite unit, which forms the core of the fold, and in the flanking sediments (Map 581 A, Geological Survey of Canada). These rocks belong to the Yellowknife Group of sediments and volcanics. The mineralization is in shears and in quartz veins which penetrate the shear zones. Some shearing is postmineralization and this complicates the distribution of the mineralized zones.

The mineralization consists of sphalerite, galena, pyrite, arsenopyrite, pyrrhotite and minor chalcopyrite. Some gold values are indicated by assay results, particularly around the fold structure toward the western end of the zone. Along the rhyolite-slate contact on the northeast limb of the fold in this area, seams of pyrite, pyrrhotite and arsenopyrite are present in the rhyolite, and pyrite, sphalerite, galena and minor chalcopyrite are present in the slate. Some graphite is present along the contact. Coarse-grained sphalerite and galena are found here in association with coarsely crystalline arsenopyrite. The vicinity of the nose of the fold is marked by fairly abundant and wide quartz veins and by fractures and shears which offset the rhyolite-sediments contact. The southwest limb of the fold is marked by a prominent gossan and extensive shearing. The gossan represents the zone of relatively massive sphalerite-galena-pyrrhotite which was investigated by previous drilling. Silver assays from this showing are closely sympathetic with those of lead and one sample was reported to have assayed 12% Pb and 6.85 oz./ton Ag, with 0.07 oz./ton Au.

Southeastward along the zone the mineralization is similar, although it is generally much weaker. A number of narrow parallel zones that are marked by rust-stained outcrops on the surface were investigated by trenching. An electromagnetic survey had been conducted on the property and a number of the anomalies were being investigated. A drill program in the vicinity of the main gossan was being contemplated to trace the lateral continuity of the zone of best mineralization.

Electromagnetic and magnetometer surveys carried out on the property during the 1966 season were quite extensive. The surveys were done on three grids, and geological mapping was also done over most of the area of each grid. The claims covered in part by these methods are listed below.

	Electromagnetic and Magnetometer Surveys	Geological Mapping
Grid A	Claims LEN 25, 26, 45-49, 54, 55, 59, 60, 65-68	Claims LEN 26, 45, 46, 48, 49, 54, 55, 59, 108
Grid G	Claims LEN 7-10, 19-21	Claims LEN 7-10, 19, 20
Grid H	Claims LEN 4-6, 11-17, 34, 35, LIM 5, 6	Claims LEN 6, 11, 12-17, 34, 35, LIM 6

Anomalies were found along the baseline on grid A along the mineralized zone described above. The anomalies extend across claims LEN 25, 26, 46, 48 and 54.

On grid G an anomaly was found which extends across claims LEN 8, 9 and 20 from "Graydon" Lake on the west. The anomaly extends into Sulphide Lake on the east.

Three principal anomalies were located on grid H. Anomaly H-1 crosses claim LEN 12 from northwest to southeast. The anomaly enters "Graydon" Lake to the northwest and "Adam" Lake to the southeast. Anomaly H-2 extends along the southeast shore of "Adam" Lake and is located largely on claim LEN 15. Anomaly H-3 enters "Graydon" Lake near the north boundary of claim LIM 5 and extends southeast onto claim LIM 6.

Giant Yellowknife Mines Ltd. (S 1-4, RS14, 15, 25 claims)
(85-I-14; about 62° 50'N; 113° 11'W)

This property on the east side of the Cameron River is owned by C. Vaydik, Yellowknife, and was under option to Giant Yellowknife Mines during the 1967 season. The property has been described by Baragar and Hornbrook (1963, p. 40). Pyrite and pyrrhotite, with minor amounts of other sulphides, form 10 to 40 per cent of a schist zone which nearly parallels basic pillow lavas and minor acidic volcanics. The volcanic rocks strike N20°-25° E and dip steeply east. A chip sample from the property assayed 0.05 oz./ton Ag, 0.14% Cu and 0.87% Zn across a width of 10 feet.

Magnetometer and electromagnetic surveys were carried out on the property in 1967. The schist zone was re-interpreted as a band of acidic tuff. Minor chalcopyrite, sphalerite and galena are associated with the iron sulphides. The mineralized zone is terminated along strike by a gabbro intrusion. The volcanics are a northward extension of the Victory Lake-Ross Lake belt.

Three holes were drilled by Giant in September and October, 1967 and two additional holes in July, 1968. The first of these holes was located at the centre of claim S2 and approximately 1,700 feet from Cameron River. The holes intersected volcanics, mainly massive and pillowed andesite, which were fragmental in part. The locations for the drillholes are listed in the table below. The baseline for the grid strikes about N20° E from an origin about 150 feet south of the mutual north corner of claims RS14 and RS15.

Hole No.	Latitude	Departure	Claim	Depth(ft.)
1	26 + 30N	0 + 10W	S2	77
2	7 + 10N	0 + 10W	S3	131
3	5 + 85N	0 + 25W	S3	157
4	8 + 00S	0 + 10E	RS14	149
5	24 + 00S	0 + 15E	RS25	139

These holes were drilled along a single conductor zone. Hole No. 1 intersected a tuffaceous bed in which a core length of 2 1/2 feet, containing quite abundant pyrite and pyrrhotite and cut by quartz stringers, assayed 0.02 oz./ton Au. However, the drilling program apparently failed to intersect any significant mineralization, and no further work on the property was planned.

North Slave Explorations (PAT 1-200 claims)
(85-I-9, 16; about 62° 46'N, 112° 10'W)

The north end of this group of claims lies 3 miles southeast of the property of Sunset Yellowknife Mines Ltd. at Sunset Lake and 3 miles southwest of Payne Lake. In a notice to shareholders (Financial Record, September 2, 1967, p. 7) the company reported that their 200-claim group was "adjacent to Northgate Explorations and Anglo United's 'Project Circle'". This statement was incorrect. It is 35 miles north from the North Slave property to the nearest Project Circle claim at Rivett Lake. Furthermore, the two lots of claims are in separate belts of rocks, although both groups cover, in part, the contact between sedimentary and volcanic units of the Yellowknife Group (Henderson, 1944; Henderson and Jolliffe, 1941; Moore, et al., 1951).

Magnetometer and electromagnetic surveys were conducted on the property in June and July 1967 by Seigel Associates Ltd. on lines spaced 400 feet apart and trending N10° E and covered about 40 claims. These surveys outlined seven anomalous zones on the property. Zones A, B and C appear to form a single zone approximately 3 miles long which consists of parallel bands of relatively highly conducting material and associated moderate to high magnetics. Zone A appears to consist of two narrow electromagnetic anomalies with a shallow source. Zone B consists of several narrow electromagnetic anomalies 400 to 800 feet long and with strikes of about N45°W. Zone C has a trend of N40° W and consists of widely scattered electromagnetic responses on the western part of the survey grid. Zone D is formed by a number of narrow conductors with an east-west trend and an associated magnetic anomaly of moderate intensity.

A program of trenching or shallow drilling was recommended to test the electromagnetic conductors. It was suggested that conductors with associated magnetic anomalies might be caused by magnetite and/or pyrrhotite, and those lacking such anomalies as possibly due to pyrite mineralization.

Preliminary geological mapping by Alrae Exploration Ltd. was also done during the 1967 season. It was found that all of the mineralized zones are located within the metamorphosed sediments. The important sulphide-bearing zones are distributed along a northwest-trending zone for a length of more than 16,000 feet. Pyrrhotite is the most common sulphide mineral, and pyrite or sphalerite are usually associated. The most massive pyrrhotite sections have the greatest continuity, but are of least economic interest. The most zinc-rich zones are located adjacent to, but not in, the zones of massive pyrrhotite. Minor galena and chalcopyrite were noted in the sulphide zones.

In 1968 geological mapping was done on the property September 16 to October 7 by Trigg, Woollett and Associates Ltd. It was found that the property is underlain by metamorphosed sediments of the Yellowknife Group. The general mapping of the area (Henderson and Jolliffe, 1941) indicates that a volcanic-sedimentary contact should pass through the claim group, but it was suggested that this contact actually lies farther to the northeast. The metasediments consist of hornblende gneiss and lesser amounts of quartzite and greywacke. The rocks strike N70° -80° W and dip steeply south. In the southeast part of the property several gossans up to several hundred feet long and 40 feet wide are present. The rock in these zones contains disseminated pyrite, pyrrhotite and sphalerite, as well as minor magnetite, chalcopyrite, galena and bornite.

No indications of mineralization, or only slight rust staining, were found near most of the electromagnetic anomalies. However, some electromagnetic anomalies were in overburden and muskeg areas. The main gossan zones on the property had strong associated electromagnetic anomalies.

Ten trenches, eight of them dug previously, on the A and B gossan zones were investigated and sampled. Most of the assay results indicated less than 0.1% Cu and less than 0.2% Zn. A few of the assay results, especially those giving higher grades than this, are listed below.

Trench	Footage From	To	Width(ft.)	Cu(%)	Zn(%)	Ni(%)
A1	0	4	4	0.02	1.75	tr.
	4	8	4	0.04	0.64	tr.
A5	0	4	4	0.05	0.03	tr.
	4	11	7	0.10	0.24	0.04
	11	18	7	0.07	0.13	0.01
B17	3	4	1	0.05	0.17	
A18	0	1.3	1.3	0.02	1.03	
	1.3	2.9	1.6	0.07	1.17	0.01
	2.9	5.0	2.1	0.17	0.77	0.02
A19	0	5	5	tr.	0.23	
	5	13	8	0.01	0.23	
	13	15	2	0.05	0.28	

It was concluded that the northwest part of the claim group had not been adequately investigated. Trenching was recommended on three anomalies along zones C and D in this area.

Giant Yellowknife Mines Ltd. (ALICE and ANN claims)
(85-I-16; about 62° 51'15"N, 112° 19'50"W) (Gold)

The ANN group of 18 claims was recorded by Giant in 1965 and an option was taken on the 22-claim ALICE group from Sunset Yellowknife Mines Ltd. prior to the 1966 season. In 1966 geological mapping, and some trenching and sampling was done on the property.

The claims are underlain by basic to intermediate volcanics which form a north-striking belt. The rocks are pillowed in part, but in part they are highly schistose. The well-developed schistosity is partly due to intense shearing of massive volcanics, but in some cases the shearing has been concentrated along tuffaceous horizons. A number of transverse faults are evident on the property, and strike faults are probably present as well.

The old shaft on the property was sunk on some high-grade pods of quartz in a shear zone conformable with the strike of the volcanics. This shaft and previous drilling suggested that the gold-bearing lenses were of limited size and discontinuous.

Early in 1967 limited electromagnetic surveying and diamond drilling were done on the property. The drilling consisted of a total of 469 feet in four holes and was done on shears that had not previously been tested. An assay on core from one hole gave a value of 0.085 oz./ton Au for a core length of 18 inches.

Terra Mining and Exploration Co. Ltd. (WOLF 1-12 claims)
(85-P-1; about 63° 09'45"N, 112° 24'25"W) (Gold)

This property is located at Spencer Lake about 20 miles east of the north end of Gordon Lake. Some work on this property was done during the 1966 season under the supervision of J. F. Irwin, consulting engineer.

The main mineralized zone on the property is located approximately 300 feet east of the west boundary of claims WOLF 9 and 10. The north section of the zone extends onto claim WOLF 8.

In 1968 ten holes, totalling 794 1/2 feet and including two holes that were abandoned at shallow depth, were drilled on the main zone. This drilling is summarized below. The baseline extends due north from an origin 125 feet S33° E from the No. 3 post of claim WOLF 10. This point of origin is located on the north shore of a small lake located partly on claim WOLF 10. All holes were inclined at 45°

Hole No.	Latitude	Departure	Bearing	Depth(ft.)
1	14N	137E	245°	102
2	113N	137E	267°	108
3	163N	91E	270°	16.5
3A	164N	111E	270°	101
4	283N	84E	265°	57
4A	296N	93E	270°	34
5	339N	97E	275°	124
6	1618N	54E	295°	124
7	1707N	75E	255°	120
8	1751N	70E	270°	8

Hole No. 4 intersected dark intermediate volcanics mixed with siliceous volcanics. These volcanics have been intruded by siliceous rock (aplite dykes?). Vein quartz is abundant in holes No. 6 and 7 from 58 to 109 feet and 76 to 100 feet, respectively. The country rock in hole No. 7 is dark highly sheared volcanics. Hole No. 5 penetrated siliceous intrusive rock that is cut by relatively narrow quartz veins, especially from 18 1/2 to 48 feet in the hole. Some disseminated pyrite and pyrrhotite are present in the quartz veins. Assay results obtained for the drill core are as listed below.

Hole No.	Intersection	Width of Sample (inches)	Au(oz./ton)	Ag(oz./ton)
1	77'6"-82'	54	tr.	---
2	52'-58'	72	0.02	0.32
2	86'-91'	60	0.01	0.10
3A	91'-96'	60	tr.	0.16
4	15'6"-17'6"	24	0.01	0.10
5	43'-48'	60	0.01	0.10
5	78'6"-82'6"	48	nil	0.36
5	108'6"-110'9"	27	nil	0.32
7	76'-80'	48	0.01	0.12
7	81'-84'	36	0.01	0.40
7	89'-92'	36	0.03	0.12

Anglo United Development Co. Ltd. (75%) - Northgate Exploration Ltd. (25%)
(75-M-5, 6, 10, 11) Rivett Lake to Camsell Lake (Copper, Zinc, Nickel)

An exploration program was conducted in 1966 with financing by the companies on the basis noted above for a 90 per cent interest in the properties held in the area. The program was launched early in the 1966 season by Precambrian Mining Services. The program was termed Project Circle and was designed to test the contacts between volcanics and sediments for base metal deposits in the belts of Yellowknife Group rocks in this area.

Two crews were employed in electromagnetic and magnetometer surveying prior to break-up, much of it on the ice on suitably located lakes, and a total of nearly 300 line miles were covered. This work resulted in 24 anomalies, of which 10 were considered to be of possible significance.

The reconnaissance electromagnetic survey covered areas on the ice along the east and west shores of the south part of Lac Sans-Disant. An area underlain by volcanics east of the north end of this section of the lake, and a discontinuous zone extending north and then west along the western sedimentary-volcanic contact in this area (see Map 738A, Henderson, 1944), was also surveyed. The latter zone of surveying extended west through "Hart" Lake (approx. 63° 22'N, 111° 44'W). Surveys were also done on the ice on Rivett Lake near the east and north shores to cover the mapped and projected contact between the volcanic rocks and the surrounding granitic rocks. Small areas on the east arm of the north part of Lac Sans-Disant and just to the north at the southwest tip of Lac du Rocher were also surveyed on the ice. The reconnaissance survey also covered a large part of the DOD group, located just east of Camsell Lake near the east end of the volcanic belt, and the northwest half of the KISS group, located just south of the most southerly part of Camsell Lake.

The claim groups that were staked in the area were the SAN 1-48, HART 11-58, DOD 1-50, GLO 1-64, RIV 1-16, DIS 1-16, BEE 1-15, AI 1-6, SANS 1-10, OTT 1-20 and KISS 1-30. Many of these were recorded in July, 1966 and some were recorded in September, 1966.

SAN Group (75-M-5; about 63° 21'45"N, 111° 52'W)

This claim group lies just north of Rivett Lake and received particular attention during the 1966 season. In August drilling was planned to test a zone 3,000 feet long and 60 feet wide (The Northern Miner, Aug. 25, 1966, p. 3). Pyrrhotite, chalcopyrite and sphalerite had been found in surface showings. The assay results indicated that copper was most important, but some zinc was also present, and values of up to 1/2 per cent nickel were obtained for samples from one showing. The showings, at least in part, are in sheared and altered basic volcanic rocks which are now amphibole-rich.

As of mid-August surface prospecting and geophysical surveys were still in progress and a drill program had just been started.

Anomaly C-3 is the most westerly of the anomalies that were tested by drilling. The anomaly strikes east-west to northeast-southwest and is caused by a warped sulphide lens. Very fine grained laminated sulphides, pyrrhotite and lesser sphalerite, with pyrite nodules, are exposed on the surface. Two trenches gave values of about 3 per cent and 7 per cent zinc over good widths. Some chalcopyrite is also present. The zone dips steeply to

the north and the country rock consists of dacite and slaty tuff. The first drillhole, drilled to a total depth of 301 feet, intersected a width of 8 1/2 feet of about 0.4% Cu on the south side of the zone and an adjacent width of 11 1/2 feet grading 2.4% Zn to the north. The second hole, to a depth of 194 feet, intersected similar mineralization but with some overlapping of the copper and zinc zones.

The C-7 anomaly lies southeast of the C-3 anomaly and extends to the east for about 2,600 feet to where it nearly joins the north end of the C-6 anomaly. The anomaly has been tested by a series of 5 drillholes with discouraging results. These holes did not test the eastern end of the anomaly sufficiently; good copper mineralization was found here in float boulders when the drill program was nearly finished. Hole C-7-1 had to be abandoned just after it entered pyrrhotite mineralization grading about 1% Zn. Hole C-7-2, from the same location, intersected two narrow bands of mineralized and graphite-bearing slaty tuff which assayed approximately 0.1% Cu and 0.4% Zn. Hole C-7-3 was located 300 feet to the east and failed to intersect anything of interest. Hole C-7-4 was drilled another 1,330 feet to the east and passed beneath the only surface exposure of the C-7 anomaly. Very fine grained pyrrhotite-rich mineralization, with coarse fracture-fillings of pyrrhotite, is exposed on surface where the rhyolite country rock is highly rust stained over a width of 15 to 20 feet. The drilling indicated mineralization over a width of 30 feet, but only narrow sections over this width assayed as high as 1% Zn and 0.5% Cu. The boulders with good-grade copper mineralization were located about 300 feet east of the latter drillhole.

Anomaly C-6 lies southeast of anomaly C-7 and extends south from where it nearly joins the latter at its eastern end. This zone is quite complex structurally and in the relationships of rock types. The mineralization, pyrrhotite with associated chalcopyrite and nickel values, is within and near the contacts of an irregular diorite dyke which strikes about north-south. The mineralized zone dips 55 to 65 degrees to the east. Up to the end of October, 1966, the zone had been tested by a series of 11 holes along a length of 1,200 feet. Hole C-6-1 intersected mineralization over a width of 14 feet which graded 0.51% Cu and 1.03% Ni. This intersection was at a depth of about 50 feet. A 12-foot intersection at a depth of about 100 feet in a hole, C-6-8, located 300 feet to the north assayed 0.85% Cu and 0.75% Ni. However, two holes located between C-6-1 and C-6-8 gave only about 0.35% Cu and 0.30% Ni over a width of 10 to 11 feet. Additional drilling at greater depth in the vicinity of the best holes was recommended.

Three additional holes were drilled on the C-6 zone between November 19 and December 3, 1966. The zone was thus investigated by 14 drillholes totalling 3,366 feet.

The exploration program in the area was continued during the 1967 season on a somewhat reduced scale. However, no further drilling was done on the SAN group.

HART Group (75-M-5; about 63° 21'N, 111° 44'W)

At the end of May, 1967, a camp was established at the north end of Lac Sans-Disant, about 6 miles east of the RIV group. Detailed electromagnetic and magnetometer surveys were done over the east part of the HART group. The geophysical surveys succeeded in tracing a strong anomaly for a

length of 800 feet. This anomaly was tested by drilling done July 1-29 and found to be due to iron sulphides and graphite. Five holes totalling 1,487 feet were drilled and the data are summarized below. The holes were all inclined at about 45 degrees. The origins and orientations of the baselines are not known.

Hole No.	Claim	Latitude	Longitude	Bearing	Depth (ft.)	Intersection	Cu(%)	Ni(%)
1-1	HART 4	4 + 29S	1 + 91E	353°	300			
1-2	HART 4	2 + 36S	5 + 96W	349°	267			
2-1	HART 1	0 + 58S	1 + 44W	340°	306			
C1-1	HART 7	3 + 58S	0 + 68E	280°	313			
Q4-1	HART 6	2 + 91S	6 + 14E	330°	301	195'-201'	0.04	0.15
						201'-207'	0.03	0.10
						208'-211'	0.06	0.15
						220'-223'	0.05	0.26

Hole Q4-1 intersected a graphitic chlorite-sulphide zone from 195 to 245 feet in the hole. This zone contains numerous pods and stringers containing 20 per cent fine-grained iron sulphides. Other holes cut similar zones, although sulphides are generally less abundant and assay values are not greater than 0.06% Cu, 0.07% Ni and 0.10% Zn.

DOD Group (75-M-10; about 63° 38'N, 110° 54'W)

This group of 50 claims is located just east of the northeast end of Camsell Lake. Some geophysical work, trenching and diamond drilling was done on this property during the 1967 season. The property was visited by the author on August 9. The core from two holes which were drilled to test the A-1 anomaly on claim DOD 13 was examined. These holes were inclined at 45 degrees and were drilled to depths of 444 and 455 feet.

The rocks are metamorphosed and, in part, recrystallized mafic volcanics. The recrystallized rocks have the appearance of gabbroic intrusive rocks, and metagabbros may, in fact, be present. The core shows weak to moderate (perhaps 10 per cent or so) pyrrhotite mineralization over core lengths of 40 to 70 feet. Except for the lack of massive sulphide sections, the geology and mineralization is similar to that investigated in 1966 by Hurley River Mines on the CAM group about 4 1/2 miles to the west. A hole drilled to test the A-9 anomaly, located about one mile south of the A-1 anomaly on claim DOD 30, indicated weak pyrrhotite mineralization in similar rocks. This hole was drilled to a depth of 367 feet and was inclined at about 47 degrees in the direction S75° W. A minor amount of chalcopyrite is associated with the pyrrhotite in the core from this hole.

The assay results from this drilling are presented in the following table.

Hole No.	Intersection	Core length(ft.)	Cu(%)	Ni(%)	Comments
1-1	57.2'-62.2'	5	0.13	0.11)	
	62.2'-72.2'	10	0.23	0.07)	
	72.2'-80.6'	8.4	0.32	0.02)	
	80.6'-85.6'	5	0.24	0.03)	
	85.6'-94.2'	8.6	0.08	0.07)	Estimated 10-15% fine
	94.2'-99.2'	5	0.38	0.09)	pyrrhotite and 1-2%
	99.2'-104.2'	5	0.28	0.07)	chalcopyrite.
	104.2'-106.4'	2.2	0.45	0.11)	
	106.4'-116.4'	10	0.24	0.09)	
	116.4'-126.4'	10	0.11	0.11)	
	126.4'-131.4'	5	0.18	0.11)	
	196.6'-201.6'	5	0.36	0.12)	
	201.6'-206.0'	4.4	0.34	0.08)	Estimated 12% iron
	206.0'-216.0'	10	0.44	0.12)	sulphides and 2-3%
	216.0'-226.0'	10	0.38	0.10)	chalcopyrite.
1-2	281'-286'	5	0.10	0.11)	
	286'-296'	10	0.11	0.07)	Estimated 6% pyrrhotite,
	296'-306'	10	0.12	0.06)	2% pyrite and up to 1%
	306'-316'	10	0.05	0.04)	chalcopyrite.
	316'-326'	10	0.05	0.07)	
9-1	88'-98'	10	0.09	tr.)	Andesite cut by irregular
	98'-108.5'	10.5	0.12	0.04)	quartz veins containing 3%
	108.5'-121.0'	12.5	0.29	0.10)	iron sulphides and minor chalcopyrite.
	136.5'-151.5'	15	0.07	tr.)	As above with 2% iron
	151.5'-161.0'	9.5	0.16	0.05)	sulphides and traces of
	161'-172'	11	0.11	tr.)	chalcopyrite.

RIV Group (75-M-5; about 63° 20'45"N, 111° 47'45"W)

In the spring of 1967 detailed electromagnetic surveys were carried out over two conductor areas located on this group of claims in 1966. One of these areas was found to contain a series of strong conductors across a width of 500 feet, including one conductor with a length of 1,200 feet and a width of up to 50 feet. The latter anomaly was selected for further investigation, but the results of this are not known.

Hurley River Mines (CAM 1-18-21-109 claims)
(75-M-11; about 63° 34'20"N, 111° 06'45"W) (Copper)

The CAM claims at Camsell Lake were optioned from Shield Resources prior to the 1966 season. The claims CAM 1-20 were recorded on April 16, 1964, and the remainder were recorded in 1966. An exploration program was conducted on the property during the 1966 season for Hurley River Mines by Alrae Exploration. The program was essentially restricted to diamond drilling to test anomalies previously outlined by Shield Resources in a reconnaissance electromagnetic survey. This electromagnetic survey delineated five anomalous areas.

In 1958 Cominco Ltd. carried out a limited exploration program, including 3 X-ray drillholes, on part of the property. Some copper mineralization was exposed by trenching in this program.

Electromagnetic coverage was extended by Hurley River Mines and two additional anomalies were found. The surveys covered claims CAM 1-3, 5-8, 10-15, 17-22, 31, 44, 50-52, 54-59, 63-65, 68-79, 81, 83, 85-89, 99-101 and 103. The drilling totalled 2,607 feet in 10 holes.

The rocks in the vicinity of the area tested by diamond drilling consist of andesitic to basaltic lavas. These lavas are pillowed in places and are irregularly intruded by gabbroic rocks and cut by fairly prominent shears parallel to and at acute angles to their strike. The gabbroic rocks may be partly of deep-seated origin, but relationships suggest that in part they have formed by recrystallization of the volcanics.

Three holes had been completed at the time the author visited the property on August 12, and a fourth was in progress. The second hole will serve as an example of the results of the drill program. This hole was drilled to 294 feet at an inclination of 45 degrees and intersected sulphide mineralization at 143 to 146 feet, 195 to 201 feet, 220 to 228 1/2 feet and 254 1/2 to 261 feet. This mineralization consists of nearly massive pyrrhotite with minor associated chalcopyrite and less commonly, traces of sphalerite. All the sulphide intersections contained only low-grade copper values.

Some assay results from the drilling are presented in the table below. The intersection in hole No. 9 and the first intersection in hole No. 8 were both logged as mineralized tuff and were estimated to contain 8 per cent and 15 per cent pyrrhotite, respectively.

Hole No.	Conductor	Intersection	Core length (ft.)	Cu(%)	Zn(%)
C-1	A	196.5'-201.3'	4.8	0.27	tr.
		220.2'-226.0'	5.8	0.20	0.12
C-7	G	298.8'-304.1'	5.3	0.35	tr.
C-8	G	229.4'-246.1'	5.2	0.47	
		264.4'-266.6'	2.2	0.35	
C-9	G		5.7	0.1	0.25

The "East Zone" or D conductor corresponds to the zone which was previously investigated by Cominco. Magnetite, in addition to the normal sulphides, forms part of the mineralization of this showing.

No further work appears to have been recommended for the property. Shield Resources recorded the EGO 1-34 claims, in the same area, in July, 1966.

GREAT SLAVE LAKE TO CAMSELL RIVER AREA

This large area is considered as a unit because airborne exploration programs for uranium covered large portions of the area, and because other more localized exploration programs were scattered throughout. The exploration activities in the immediate vicinity of the Camsell River are treated in a separate section since work on a number of properties there was concentrated in a relatively small area.

Exploration in the area was primarily for uranium and included a number of airborne gamma-ray spectrometer surveys which covered relatively large areas. In addition to the exploration for uranium, work was done on a cobalt-bismuth property near Lou Lake, two gold properties in the Indian Lake area, a copper-tungsten property at Lever Lake, and the alkaline complex at Bigspruce Lake.

In addition to the exploration programs described in this section, an airborne exploration program was carried out in the area by Atlantic Richfield Corp. employing a Queenair aircraft. The exact area covered by this program is not known.

Texas Gulf Sulphur apparently drilled 5 or 6 holes in the Paleozoic sediments just west of Hottah Lake early in the 1968 season to test the stratigraphic section. This drilling was reported to have indicated shale, bituminous dolomite, and shale as successive units overlying sandstone. The lower shale is about 15 feet thick and consists of a chalcocite-bearing section at the base overlain by interlayered red and green shale, and this in turn is overlain by grey shale. The bituminous dolomite unit is about 200 feet thick and contains minor disseminated chalcopyrite. The upper shale is red with green patches and contains thin dolomite interbeds at the base.

During February and March 1966 an induced polarization survey was conducted over an area near or on Hottah Lake, possibly on the northeast part of the lake, by Northwest Explorers. No details of this program are known to the author. Undoubtedly other exploration activities in the general area occurred but were not made known to the author.

Cominco Ltd. (TAG 1-9, EB 1-36, TIE 1-18, PIE 19-54, LIE 55-90 and DIE 91-106 claims) (85-J-12, 13; about 62°48'N, 115°45'W) (Uranium)

These claims extend for 10 miles north from Great Slave Lake along the west side of Stagg River. The claims were staked July to September, 1966 and reportedly covered radioactive zones along a band of highly metamorphosed conglomerate. It was subsequently found that no conglomerate was present on the property. The LIE and DIE groups overlap part of the former AAW and ABW groups which were staked in 1955. The property was optioned by Cominco from Murco Mines prior to the 1967 season.

Some of the claims of these groups were investigated during the 1967 season by geological mapping, geiger counter surveying, trenching and a number of shallow diamond-drill holes. Trenches on the EB group showed some copper staining and some yellow uranium stain (gummite).

Geological mapping of the TIE 1-18, PIE 19-28 and EB 27-36 was carried out August 1-10, 1967, by R. Nichols. Some geiger counter surveying and trenching were also done. Uranium staining and weak radioactivity are quite common, but the mineralization, along zones of sheared granitic rock, is low grade. It was reported that the mineralization is of secondary origin, localized within a thin weathered zone near the bedrock surface. Phosphuranylite has been identified as one of the secondary yellow uranium minerals which occur in scattered patches. The location and nature of the primary source of the surface mineralization have apparently not been identified.

The Stagg River fault zone, mapped as 800 to 1,400 feet wide, trends at S 15 E across the property. Chloritic and sericitic alteration were found to be most intense in the vicinity of the fault zone.

Drilling was carried out on the property as follows:

Hole No.	Claim	Depth(ft.)	Comments
67-1	TIE 14	100	Coarse pink quartz monzonite; sheared sections at irregular intervals with chlorite stringers and pyrite mineralization.
67-2	TIE 14	100	
67-3	DIE 91	100	Granite and porphyritic granite with some fairly mafic-rich zones.
67-4	DIE 91	105	
67-5	EB 6	100	Granite, partly porphyritic.
67-6	TAG 5	35	Granite. Located in the very northeast corner of the claim.

Giant Yellowknife Mines Ltd. (MAR 1-27 claims)
(85-K-16; about 62° 57'N, 116° 16'15"W) (Uranium)

This property is on Bedford Point on the west shore of Marian Lake. The claims were staked in May, 1965, to cover a known radioactive occurrence (Thorpe, 1966, p. 8). The western of two faults, which are 500 to 600 feet apart and strike N 20° W, is marked by a quartz stockwork that is at least 100 feet wide. The quartz stockwork zone dips to the west at 50° to 60° and the west contact of the zone is covered by overburden. The east contact of the zone is mineralized, within the quartz stockwork and also in brecciated granodiorite country rock, over a width of at least 700 feet. It is possible that the covered west contact zone is also mineralized.

Some geological mapping, detailed scintillometer surveying, and sampling was done on the property during the 1966 season. The scintillometer survey was done on a grid with lines spaced 10 feet apart in the vicinity of the main mineralized area on claim MAR 15. This survey extended over a length of 1,200 feet, but the main block of ground covered is about 550 feet north-south by 450 feet east-west. Toward the end of the season ten fairly large samples, containing significant pyrite and other sulphides, were taken. Four or five of these samples indicated significant uranium by radiometric testing and four samples were analyzed chemically. These chemically analyzed samples gave 0.05% U_3O_8 and 0.132% U_3O_8 for two channel samples taken in trenches and representing widths of 26 and 10 feet, respectively. A chip sample taken from boulders over a width of 50 feet assayed 0.10% U_3O_8. The fourth sample gave a grade of 0.035% U_3O_8.

A diamond-drilling program consisting of 1,002 feet in three holes was carried out on the property March 19 to April 14, 1967. In the summer of 1967 much more trenching work was done on the south part of the property but indicated only spotty and low radioactivity.

Brecciated, altered (brick red) granodiorite with a stockwork of quartz stringers extended to a depth of 98 1/2 feet in hole 1, to 44 1/2 feet in hole 2 and to 90 1/2 feet in hole 3. Second, third and fourth zones of altered granodiorite were intersected in hole 2 from 61 1/2 to 107 1/2 feet, from 140 to 147 feet, and 177 to 216 1/2 feet, respectively. The fourth altered zone was also intersected in hole 1 at 233 1/2 to 257 1/2 feet and contained low uranium values. Assays for some sections of the altered zones in hole 2 are as follows:

Intersection	Width(ft.)	$\%U_3O_8$
99' - 107 1/2'	8 1/2	0.03
140' - 147'	7	0.04
210' - 214 1/2'	4 1/2	0.02
214 1/2' - 216 1/2'	2	0.08
(215 1/2' - 216 1/2')	1	0.11

Westrim Mining Corp. Ltd. (Marian River area)

An airborne exploration program for uranium was carried out for this company during the 1968 season by Dolmage, Campbell and Associates Ltd. The program covered parts of the area underlain by Precambrian rocks between 116° and 117° W longitude and from 63° to roughly 64° 30'N latitude. The program was under the direction of Dr. L. T. Jory. Union Minière had participation in the program through purchase of an equity interest in Westrim Mining Corp.

The survey was flown by helicopter at approximately 50 miles per hour and 150 feet ground clearance. Sensitive gamma-ray spectrometer equipment was being flown with automatic 4 channel recording of radar altimeter, potassium, potassium and uranium, and potassium and uranium and thorium readings.

When the exploration camp near Zinto Lake was visited on August 13 approximately 2,000 line miles had been flown along reconnaissance lines spaced at 1/4 to 1 mile. This program had entailed about 150 hours of helicopter flying including equipment tests, checking anomalies for more precise location, and the shuttling of ground crews. In test flying good anomalies were obtained over the small deposit of Consolidated Northland Mines on the SUN group (85-N-1; approx. 63° 08'30"N, 116° 19'15"W) and a small occurrence on the DV group near DeVries Lake (86-C-7; approx. 64° 16'N, 116° 44'W) held by Shield Resources. Readings were off scale over the formerly producing property of Rayrock Mines.

Shield Resources and Angus Petroleum Consultants Ltd.
(Marian River area)

These companies undertook a joint airborne exploration program for uranium in the general Marian River to DeVries Lake (approx. 64° 19'N, 116° 45'W) area in 1967. The program was carried out by helicopter and structural features provided the main guide for the airborne work. In test flights a very good response was obtained over the small deposit of Consolidated Northland Mines on the SUN group (85-N-1; approx. 63° 08'30"N, 116° 19'15"W) and some good responses were obtained over the upper pits of the former Rayrock Mine.

As a result of this reconnaissance exploration a total of 172 claims in 4 groups were staked to cover the discoveries and areas of geological interest. This staking included the RA and DV groups at DeVries Lake.

Westrim Mining Corp. Ltd. (MIC, A1 and 31 REX claims)
(85-N-1; about 63° 10'30"N, 116° 19'10"W) (Uranium)

Five holes totalling 1,500 feet were drilled on the MIC claim in the Marian River area between November 25 and December 22, 1967, under the supervision of Dr. L.T. Jory of Dolmage, Campbell and Associates Ltd. These holes were to depths of 256, 246, 255, 246 and 497 feet. All holes were inclined at 45° -50° and tested the subsurface beneath an outcrop area, approximately 500 by 300 feet, of hematitic altered syenite porphyry.

The syenite is cut by steeply dipping fractures which are closely spaced and generally very minor. The uranium mineralization appears to be located in the fine fractures. The syenite has an average radioactivity of 4 times background. Pitchblende was observed in only one thin carbonate veinlet in drill core. The drill results indicated that the syenite body is essentially vertical. The syenite appears to form a stock-like body in other syenitic phases of the coarse intrusive country rock.

In general, quartz and calcite veinlets, chalcopyrite and hematite are confined to three drillholes. These holes showed short radioactive sections generally in gneissic syenite porphyry, of 8 or more times background and 13 samples were sent for assay with the following results:

Hole No.	Footage	Width(ft.)	Counts/minute	Radiometric U_3O_8
1	136.0-137.2	1.2	1,000	0.020
1	168.4-168.9	0.5	10,000	0.350
1	174.8-176.3	1.5	1,250-2,750	0.045
1	226.7-227.3	0.6	1,250-2,000	0.075
2	165.7-166.3	0.6	1,250-2,000	0.060
2	198.7-199.5	0.8	1,250-2,500	0.017
2	200.5-201.5	1.0	1,500-6,700	0.092
2	201.5-202.5	1.0	5,500	0.160
5	6.1-6.8	0.7	1,000-2,000	0.050
5	15.6-16.5	0.9	750-2,000	0.048
5	20.4-20.9	0.5	500-1,000	0.022
5	61.8-62.8	1.0	1,250-2,500	0.073
5	220.3-220.9	0.6	1,000-2,000	0.071

These values are so widely scattered and over such narrow widths that they are not of economic interest. However, the widespread nature of the uranium mineralization, the feldspathization, the hematization, and the presence of major fault structures were considered to be favourable for the occurrence of significant mineralization.

In June, 1968, the 33-claim property was geologically mapped at 500 feet to the inch by H. Naylor and D. Blanchflower of Dolmage Campbell and Associates Ltd. under the supervision of C.R. Saunders.

Mafic syenite with widespread epidote and hematite alteration is exposed across the northern part of the property. The rock is fine grained to medium grained and contains about 30 per cent combined hornblende and biotite. Medium- to coarse-grained syenite and syenite porphyry are exposed over large areas in the southwest part of the claim group and in a few places

near the centre of the group. The margins of the bodies are gneissic. The rocks are hematitic, and contain deep brick red orthoclase crystals, less than 15 per cent biotite and less than 10 per cent quartz.

Radioactive showings known previous to work by Westrim Mining are in syenitic rocks where these are intensely altered. Typically radioactivity is 4 to 6 times background over an area several hundred feet in diameter with small areas up to 40 times background. Most of these local high areas are on the MIC and A1 claims and had been trenched to reveal pitchblende and gummite on steeply dipping fracture planes.

Coarse-grained granite containing euhedral feldspar which weather brick red, is exposed on part of the southern two-thirds of the property, especially to the east of centre. A phase showing minor gummite staining and bleaching is present to the west of centre on the group. A medium-grained, pink-weathering quartzose granite is present on the east edge of the property. Pegmatitic phases of the rock are common, and some more pegmatitic, bleached, and gummite-stained areas have been mapped separately.

The radioactive occurrences in quartzose granites are similar to those in the syenitic rocks, except that the widespread occurrence of gummite stain on the weathered outcrop surface seems to indicate that the uranium mineralization is disseminated in the rock. Areas of widespread gummite staining average about 3 times background and these were sampled. The results of this sampling are not known, but favourable results would suggest the presence of a very large tonnage of low-grade ore.

A program of shallow drilling was recommended if the sampling indicated a grade of at least 0.05% U_3O_8.

Paul Conroy (PAL 1-10 claims)
(85-N-7; about 63° 19'20"N, 116° 47'40"W) (Uranium)

A report was prepared on this property at Sheldon Lake by Orhan Baykal after he investigated it briefly during the latter part of July, 1967. The general geology of the area is shown by McGlynn (1956).

Granodiorite and gneissic feldspar porphyry are the main rock types. Quartz stockworks are present along the regional Marian River Fault and subsidiary faults; southeast of Sheldon Lake the main stockwork along the Marian River Fault is about 200 feet wide. This fault is reported to strike N33° E and dip 75° to 80° SE on the property.

Minor uranium mineralization is associated with veins of specular hematite which occupy fractures cutting granodiorite, gneissic feldspar porphyry and the quartz stockwork. Several pits present on the property result from previous work, probably by Altomac Uranium Mines Ltd. These pits contain narrow hematite-filled fractures but showed only weak radioactivity.

A systematic scintillometer survey was recommended. The property was allowed to lapse August 8, 1968.

BrenMac Mines Ltd. and Lakeland Base Metals Ltd.
(Marian River area) (Uranium)

These companies carried out a joint investigation of seven separate properties, totalling 347 claims, in this general area during the 1967 season.

(The Financial Record, June 17, 1967, p. 5; The Northern Miner, Sept. 14, 1967, p. 18). The program was under the direction of B. C. MacDonald. Some scintillometer survey work was carried out on the properties, some of which were known to contain radioactive occurrences. The claim groups in question were never registered in the name of the companies concerned and their exact locations are not known. One or more groups may have been in the vicinity of the former REX group (about 63° 21'N, 116° 47 1/2'W) and most were apparently near the Marian River Fault. The general geology of this area has been mapped by McGlynn (1956).

The assets of Lakeland Base Metals Ltd. were acquired by BrenMac Mines Ltd. in May, 1968.

Anglo United Development Corp. (10 and CJ claims)
(85-N-8; about 63° 21'N, 116° 18'W) (Gold)

A summary description of this property has been given previously (Thorpe, 1966, p. 6). In June, 1968, it was reported (The Northern Miner, June 20, p. 18) that a resumption of exploration was planned for this property. However, no further exploration was commenced on the property during 1968.

New Athona Mines Ltd. (CAB 1-5, 7-18 claims)
(85-N-10; about 63° 33'N, 116° 45'W) (Cobalt, Bismuth)

This property is in the Marian River area about 6 miles east of Hislop Lake and about 110 miles northwest of Yellowknife. The company optioned 12 claims from K. J. McDonald of Yellowknife and made an agreement to do 2,000 feet of diamond drilling. Five additional claims were subsequently staked.

The arsenide veins on the property occur in a unit of feldspar and feldspar-quartz porphyries (Unit 7 of Map 690A; Lord, 1942). These rocks may be a series of extrusive acidic lavas and ignimbrites. Similar porphyries near Ellington Lake, about 110 miles to the north, form a shallow basin and are recognized as of extrusive and, in part, pyroclastic origin (Lord, 1952). Likewise, Fraser (1967) recognized a similar origin for rocks some distance southwest of the latter locality. Interlayered (?) rocks have been logged as black, massive, altered sediment and grey to black quartz-mica schist, but it is possible that these rocks were originally basic tuffs or contained a significant tuffaceous component.

Diamond drilling was carried out on the property from July 21 to August 24, 1968, under the supervision of Mackenzie Management and Engineering, Yellowknife. The first 4 holes tested the No. 1 zone (approx. 63° 33'08"N, 116° 45'W) along a length of about 500 feet and 2 holes tested the No. 2 zone (approx. 63° 32'58"N, 116° 44'45"W and about 850 feet south-southeast of the No. 1 zone). The property was visited on August 13 when drilling had just been completed on the No. 1 zone. Massive arsenides over widths of about one foot were observed in core from this zone. The No. 1 zone is on claim CAB 1 and the No. 2 zone on claim CAB 2. The details of the drilling are as follows:

Hole No.	Inclination	Azimuth	Depth(ft.)	Intersection	Bi (lb./ton)	Co (lb./ton)
68-01	45°	19°	202	79.5' - 177'	4.22	1.17
68-02	45°	194° 30'	211	70'(?) - 82.2'	7.25	3.67
68-03	55°	11°	175			
68-04	55°	19°	151			
68-05	45°	200° 30'	198			
68-06	55°	230° 15'	62	18.8' - 23'	5	16.6

The No. 1 zone has a known surface length of 920 feet (Northern Miner, Nov. 28, 1968, p. 98). The arsenide mineralization occurs in nearly massive bands and lenses, which show some evidence of discontinuity and en echelon arrangement along the zone, and disseminated for some distance into the wall-rocks. This zone has a strike of N35° to 50° W and appears to dip nearly vertically. Of two samples from a trench near the west end of the zone, one gave 7.20 lb./ton Bi and 16.4 lb./ton Co and the other 2.4 lb./ton Bi and 6.8 lb./ton Co.

The three drillholes which intersected the No. 1 zone (hole 68-03 failed to intersect the zone) were distributed along a length of 240 feet. The 97.5-foot core intersection listed above for hole 68-01 was from resampling of the core late in the season and the more detailed results are not available. In hole 68-02 a 5-foot section which assayed 2 lb./ton Bi, 9.64 lb./ton Co and 4 lb./ton Cu is reported (Northern Miner, Nov. 28, 1968, p. 98) from above the 12.2-foot intersection listed above. It is reported that slightly lower results were obtained in hole 68-04.

The No. 2 zone is exposed as a nearly solid mass of arsenides about 10 feet wide which is exposed for only a short length. The vein strikes about N65° W and may dip very steeply to the north. It appears to pinch out toward the east as trenches in this direction have been unsuccessful in tracing the mineralization. A natural trench about 8 feet in width follows along the strike extension to the west, but it has been reported that trenching has successfully extended the vein in that direction (Northern Miner, Nov. 28, 1968, p. 98). A sample from a trench on the vein assayed 0.21 oz./ton Au, 13.2 lb./ton Bi and 65.6 lb./ton Co. A sample from a trench farther west on the zone gave 0.19 oz./ton Au, 10.8 lb./ton Bi and 45.6 lb./ton Co. It is reported that the zone on surface shows consistent values in gold of about 0.17 oz./ton. The 4.2-foot section noted above for hole 68-06 also gave an assay of 0.08 oz./ton Au.

A bulk sample of ore from the property was submitted to the Mines Branch, Ottawa, on August 18, 1965. A chemical analysis of the sample gave the following results:

Co(%)	Fe(%)	S(%)	As(%)	Ag(oz./ton)	Au(oz./ton)	Bi(%)
2.36	22.46	16.04	40.84	0.18	0.14	0.63

A mineralogical examination of the crushed ore indicated that the predominant mineral was arsenopyrite. Hematite and bismuthinite were present in minor amounts, and native silver, native gold, chalcopyrite, pyrite, pyrrhotite, ilmenite, magnetite, and emplectite were present in trace amounts. The silver, gold, and pyrrhotite occur as minute inclusions in arsenopyrite. Bismuthinite, chalcopyrite, pyrite, and emplectite were found to be present mainly as free grains. Some bismuthinite occurs as inclusions in arsenopyrite

and it was observed in close association with chalcopyrite in a few grains. The cobalt content of a concentrate of arsenopyrite was found to contain 5.75% Co and it was concluded that the cobalt is a constituent of the mineral, probably in solid solution, since no independent cobalt minerals could be found.

On the basis of the mineralogical work and concentration tests on the ore Mathieu (1966) reported that initial attempts to produce a concentrate containing 10 to 15% Co were completely unsuccessful. In fact, the ore could only be upgraded from 2.3% Co to 2.8% Co. He suggested that considerable research might be necessary to develop a chemical process for economically recovering the cobalt from such a low grade concentrate.

Because gold is intergrown with arsenopyrite, very little concentration was possible. However, it was found that cyanidation would extract about 75 per cent of the gold from either the raw ore or a bulk concentrate.

It was concluded that less than 25 per cent of the bismuthinite occurs as free grains which range in size from 6 to 130 microns across. The occurrence of much of the bismuthinite as inclusions in arsenopyrite holds the recovery of bismuth to about 50 per cent. With the best procedure found to recover the bismuthinite, bulk flotation followed by separation, it was not possible to obtain a concentrate grade higher than 19.5% bismuth (Mathieu, 1966).

A sizable exploration program has been recommended for 1969 to include further surface prospecting, a geophysical survey, additional diamond drilling and complete sampling of all core obtained in 1968. A drill and equipment were stored on the property at the end of the 1968 season. However, extension of the arsenide-bearing veins will be largely an academic exercise until solutions have been found to the processing problems that have been outlined above.

Fort Reliance Minerals (50%) and Nahanni Mines (50%) (NAN 1-20 claims)
(85-N-10; about 63° 37'45"N, 116° 39'W) (Uranium)

This claim group was recorded in early August, 1966, and a preliminary scintillometer survey and geological mapping were done before the end of the year. Furthermore detailed investigation of the property was planned for the 1967 season.

A radioactive showing is located on claim NAN 7 and radioactive boulders are found near a northeast-striking fault on claim NAN 16. The geological mapping was done at 200 feet to the inch and indicated that the claim group is largely underlain by mylonites and interbedded schists, mainly quartz-biotite and biotite-plagioclase types. These rocks trend northeast on the south part of the property and north to north-northeast on the north part. The rocks are cut by a great number of northeast-striking faults. A number of small metamorphosed syenite and monzonite bodies are located here and there on the property, but larger areas of these rocks underlie claims NAN 5 and 7. In most cases the northwest and southeast contacts of these intrusions are formed by faults. The schistose rocks were considered to be metamorphosed sediments of the Snare Group. The schistosity strikes northwest-southeast.

In a previous exploration program on the property in 1953 a few short holes were drilled near the northwest corner of claim NAN 6. The showing on claim NAN 7 consists of very narrow actinolite veins which strike

N60° E, parallel to the main set of faults. The veins contain up to 1% U_3O_8, according to previous sampling, but were considered too small to warrant further attention. The mineralization in the boulders on claim NAN 16 is similar, but apatite, fluorite, and coarser actinolite are present.

A geiger counter survey on the property resulted in the location of six anomalies. These anomalies were weak, about twice background, and most were in overburden areas in proximity to faults.

Two short diamond-drill holes were recommended to test the two anomalies considered to be most significant.

J.R. Woolgar (IRA claims) (85-N-10; about 63° 37'N, 116° 33'W) (Uranium)

This property was investigated in 1967 by a crew under the supervision of K. Christie. The work, primarily trenching with some scintillometer testing, was done on behalf of an unknown client. Pitchblende is reported to occur in fractures along a giant quartz vein or quartz stockwork. In one trench on the property a pitchblende veinlet reportedly widens from 1/8 inch at the surface to 4 inches (including a central quartz stringer) at a depth of 6 feet and then narrows to 2 inches again at the bottom of the trench at a depth of 8 feet.

This property could be a restaking of the WILL group of claims on which Iso Uranium Mines drilled 2,087 feet in 10 holes in 1955. The drilling failed to indicate any mineralization although radioactivity, associated with hematite and chalcopyrite, was present along fractures for a length of 500 feet in a giant quartz vein. The giant quartz vein is about 100 feet wide and was traced in granitic rocks for 3 miles along a strike of 120°. Mineralized sections up to 40 feet long and 1 foot wide were indicated on the surface.

The general geology of the area is shown by Map 690A (Lord, 1942).

Giant Yellowknife Mines (BS 6-151 claims)
(85-O-12; about 63° 33'N; 115° 55'W) (Niobium)

The alkaline complex at Bigspruce Lake was staked by Giant Yellowknife Mines during the winter and early spring of 1968. The general outline of this complex is shown on Map 690A (Lord, 1942). The complex was mapped and investigated on a reconnaissance basis during the 1968 season, with the aid of previous and concurrent academic study of the body.

The northern part of the complex consists of a layered series of dioritic rocks interrupted by extensive intrusive or xenolithic bodies of ultrabasic rocks. These iron-rich dioritic rocks form a nearly circular body with inward dips of about 35° - 45°. Pyroxene-rich bands define the layering in the dioritic rocks.

The central part of the complex consists of nordmarkites. These are mafic, quartz-poor, syenites, light pink in colour, which appear to comprise a number of separate intrusions. One nordmarkite intrusion appears to form a ring dyke crosscutting the layered dioritic series.

The southern part of the complex consists of a large mass of nepheline-bearing rocks. Coarse foyaite and urtite form the central part of this mass, which is poorly exposed and presumably lies mostly under the lake. Medium-grained ijolite forms a relatively large mass on Big Spruce Island and apparently continues as a bordering zone around the coarser

nepheline-bearing rocks. Minor dykes of biotite-carbonatite occupy late shear zones cutting the nepheline-bearing rocks.

The complex is being investigated with regard to the economic possibilities for niobium and other elements.

Precambrian Mining Services Ltd.
(Mattberry Lake-Basler Lake area; 86-B-4, 85-N-16, 85-O-13)

A reconnaissance investigation of conglomerates of the Snare Group as to their uranium-bearing possibilities was carried out in this area by a two-man crew in June and July, 1967. The general geology of the area is given by Lord (1942). A weakly radioactive zone 800 feet long and an average of 50 feet wide was located near the south end of Basler Lake and a few claims were staked. Pyritic conglomerate beds that were weakly radioactive were investigated near the east shore of Basler Lake (approx. 63° 57'N, 115° 52'W) but were found to contain only a trace of uranium and no gold.

The contacts of the sedimentary belt were followed southwest from Basler Lake and also south to Kwejinne Lake. A radioactive pyritic zone in conglomerate and other sediments was located on Kwejinne Lake near the centre of the eastern shore. The zone is about 50 feet wide and 600 feet long but the uranium content is presumed to be low.

Discovery Mines Ltd. (AE, GI and BOB claims)
(86-B-6; about 64° 22 1/2'N, 115° 06 1/2'W) (Gold)

This company obtained a long-term option on property owned in the general Indin Lake area from Hydra Explorations Ltd. This property included the AE group formerly owned by Goldcrest Mines Ltd. and the GI group formerly owned by Colomac Yellowknife Mines Ltd. and Indian Lake Gold Mines Ltd. The BOB group of 24 claims was recently staked by Discovery Mines.

The geology of the area is shown by Map 1023A (Tremblay et al., 1954). The GI group was staked in February, 1945, and gold was discovered in May, 1945, in a north-south striking quartz-albite sill or dyke in the volcanic rocks of the Yellowknife Group. The sill lies just west of Baton Lake and closely parallels the east contact of a wider sill-like body of gabbro, to which it may be genetically related. Exploration work on the property has been summarized by Lord (1951, p. 95). The quartz-albite host rock, containing a little chlorite, biotite, hornblende, and pyrrhotite, is known as the Colomac dyke and has been traced for a length of about 20,000 feet. The dyke is up to 240 feet wide and averages at least 110 feet. Drilling was carried out in the autumn of 1945 and during 1946, and the dyke was also investigated by an underground program in 1946. This diamond drilling was along a strike length of about 19,000 feet with holes intersecting the dyke at 100-200 feet below surface and on centres not more than 500 feet apart. A deeper tier of holes at 250-foot centres tested a strike length of about 3,000 feet. A total of about 2,500 feet of underground work was done and part of the material was run through a bulk sampling plant. The grade for the lode in the vicinity of the underground work was apparently about 0.085 oz./ton Au.

The AE group of claims was staked for Goldcrest Mines Ltd. in January, 1945, and diamond drilling on the Goldcrest dyke totalled 10,356 feet

to the end of 1946 (Stanton, 1947; Lord, 1951, p. 173). This dyke is about 800-1,300 feet west of the south end of the Colomac dyke, is about 150 feet wide, and has been traced for a strike length of about 2,000 feet.

Work by Discovery Mines in 1968 consisted of a re-evaluation of the information available on these dykes, a geological reconnaissance of the area, and an attempt to extend the known length of the dykes by trenching. The latter attempt met with little success.

It was tentatively concluded that the gold mineralization was localized in a series of pyrite-bearing quartz stringers with very shallow dips which were confined to the dykes. From the results of the old drilling the mineralization in the Goldcrest dyke appears to be more erratic than in the Colomac dyke.

While the dyke dimensions indicate a very large tonnage of low-grade material, it has been concluded that there is no possibility of economic development without a significant rise in the price of gold. Assuming a production rate of 3,000 ton per day, a 100 per cent increase in the price of gold would make the economics of open-pit mining reasonably attractive. For investigation of these dykes in the future a program to consist of vertical diamond drilling and rehabilitation of the old Colomac workings to enable more drifting in the Colomac dyke, was recommended.

Falconbridge Nickel Mines Ltd. (JERRY 2-19 claims)
(86-B-6; about 64° 29'45"N, 115° 09'30"W) (Gold)

A work program consisting of geological mapping, trenching and sampling was carried out June 28 to July 31, 1967, by Giant Yellowknife Mines Ltd., an affiliated company, on this gold prospect at Spider Lake in the Indin Lake area.

Rocks exposed on the property consist of volcanics, sediments, metasediments and basic intrusions. Foliation is well developed in all the rock types except the basic intrusions. Several major faults of unknown displacement were mapped on the property.

Pyrite, chalcopyrite and arsenopyrite occur locally as disseminations, and in massive form over very small areas, in quartz veins and irregular quartz masses. Numerous quartz occurrences on the property, however, do not contain sulphides. From 67 samples taken on the property the best assay results were 0.05, 0.05, 0.06, 0.05, 0.09 and 0.07 oz. Au/ton.

No further work was recommended on the property.

Westrim Mining Corp. Ltd. (TYKE 3, 5-7, 9-11, 13-15 claims)
(86-C-2; about 64° 14'N, 116° 42'15"W) (Uranium)

This 10-claim group is located in the DeVries Lake area. A drill program consisting of 5 vertical holes totalling 832 feet was conducted on the TYKE 7 claim in the period September 1-17, 1968. The holes intersected white arkosic quartzite with interbeds of mica schist and quartz-mica schist, quartz-feldspar gneiss, and minor arkose and hornblende-schist. Some green epidote-rich and calcareous bands apparently represent original carbonate horizons. Chemical assay results for uranium indicated generally less than 0.01% U_3O_8; samples giving 0.01% U_3O_8 or better were as listed as follows.

Hole No.	Intersection	Core length(ft.)	U_3O_8(%)
T3	105' - 120'	15	0.012
T3	160' - 175'	15	0.01
T5	115' - 130'	15	0.01

Shield Resources Ltd. (FAB 1-49 claims)
(86-C-3; about 64° 08'N, 117° 07'W) (Uranium)

The property is in the Rae Lakes area about 75 miles north of Marian Lake. The general geology of the area is shown by Map 1224A (Fraser, 1967). A high magnetic anomaly is present on the property. A preliminary investigation of the property in 1968 indicated several radioactive zones.

Feldspar porphyry, probably of volcanic origin, and interbedded horizons of fragmental volcanic rocks form a north-northwesterly trending belt on the property. These rocks are intruded by an equigranular granite to the west and a granite porphyry to the east. The fragmental horizons consist of tuff, fragmented porphyry and volcanic breccia. Irregular concentrations of magnetite occur throughout the fragmental rocks, in some places extending into the feldspar porphyry, and no doubt account for the magnetic anomaly. A quartz stockwork of the "giant quartz vein" type, at least 100 feet wide, is present at the boundary between claims FAB 1 and 13 near their western margin.

The radioactive occurrences are within the fragmental horizons. Showing A2 toward the southeast corner of claim FAB 1 has an exposed length of about 60 feet and a width of up to about 6 feet. Grab samples from this showing assay as high as 1% U_3O_8 (chemical). A similar showing, A3, apparently of lower grade, is located toward the southeast corner of claim FAB 5. These showings are located at approximately 64° 07'30"N, 117° 07'10"W and 64° 07'15"N, 117° 06'45"W, respectively.

Geological mapping in the vicinity of the radioactive showings is planned for the 1969 season. Trenching and sampling of the showings were also recommended.

Shield Resources (RA 1-84 claims)
(86-C-7; about 64° 21'36"N, 116° 46'37"W) (Uranium, Molybdenum)

This group of 84 claims at DeVries Lake was staked in 1967 as a result of the joint helicopter exploration program by Shield Resources and Angus Petroleum Consultants Ltd. The property includes most or all of the former NORI group which was investigated by Radiore Mines about 1956. The main zone to be trenched in earlier work was a magnetite-rich band in quartz-biotite paragneiss. Some amphibolite bands, coarse biotite, and narrow pegmatitic stringers are associated with the zone which shows radioactivity across 5 feet for a length of 170 feet along a northwest strike. Channel samples gave up to 0.2% U_3O_8.

The staking in 1967, however, was because of other anomalies discovered on the property, particularly some responses from fairly heavily wooded areas. Ground scintillometer and magnetometer surveys were carried out over the property and extensive trenching was carried out on the

radioactive zones. It was discovered that a number of the radioactive zones were also molybdenite-bearing. The molybdenite is especially evident in some of the old trenches, although its presence is apparently not mentioned in the records of previous work. Further trenching and sampling were initiated following the recognition of molybdenite. The property was visited by the author on August 7, 1967, and again later in the season.

Magnetite Zone

The zone in paragneiss which was noted above is located about 1,100 feet north of the north shore of DeVries Lake. Bands of massive magnetite are present along the zone which was extensively trenched across a width of 10 to 30 feet during the previous investigation of the property. High radioactivity is associated with the magnetite, but the mineral responsible for this radioactivity is not known. The narrow pegmatitic stringers which occur along the zone form a ptygmatic pattern in the gneiss. No molybdenite was observed, although a careful examination was made. No further work was done on this zone by Shield Resources.

Zone 2

Zone 2 (of Shield Resources) is located about 500 feet south and 1,200 feet west of the showing described above and is on claim RA 4. The showing was apparently not investigated by Radiore Mines. Trench 204 on this zone is 45 feet long and crosses 27 feet of biotite-quartz gneiss and then, to the west, cuts sheared and leached pyrite-rich siliceous rock which has decomposed to a pale yellow mud. Some fair radioactivity, good uranium staining, and minor molybdenite are present across a width of 11 feet. The mineralized zone trends about north-south. Some assay results from trenching on the zone are presented in the following table. The grid has lines oriented north-south and east-west and its origin is apparently near the southeast corner of claim RA 5.

Trench	Latitude	Departure	Width(ft.)	MoS_2(%)	U_3O_8(%)	
202	0 + 30S	11 + 30W	4	0.31	0.017	
			1	0.84	0.065	
			3	0.29	0.026	
204	0 + 40S	11 + 30W	4	0.03	0.008	Biotite-quartz gneiss
			4	0.06	0.008	
			3	0.11	0.006	
			3	0.18	0.004	
			3	0.23	tr.	
			5	tr.	tr.	Oxidized pyrite siliceous zone
			5	0.03	0.02	
			5	0.03	0.006	
			2.5	tr.	0.008	
203	0 + 80S	11 + 35W	3	0.07		
			3	0.10		
205	2 + 20S	12 + 15W	2	0.05		
(Grab)	3 + 90S	12 + 75W	-	0.04		
(Grab)	4 + 40S	12 + 90W	-	3.25	tr.	0.4 oz./ton Ag

In February and March 1968 a drill program consisting of 17 holes totalling 3,010 feet was conducted on the property. The first seven holes in this program (total 1,283 ft.) were drilled on the No. 2 zone, but assays on the core failed to indicate any significant values.

Zone 8

This zone extends from 3 + 80S at 14 + 00 to 14 + 50W south to 6 + 00S at 14 + 70W, and may be a folded extension of zone No. 2. The best assay results from trenching at the north end of the zone were 0.03% MoS_2 across 7 feet and 0.3 oz./ton Ag across a width of 5 feet. This trenching was done during the 1967 season.

No. 1 Area

The No. 1 area is located approximately 1,000 feet east-southeast of Zone 2 and is on claim RA 5. In this area good molybdenite and uranium mineralization are associated with bands of nearly massive coarse biotite in paragneiss. High radioactivity and good molybdenite are present along the south end of a low cliff which marks the south end of the outcrop area, but the mineralized bands become much narrower and decrease markedly in radioactivity toward the north. This is apparently the area where radioactivity in three closely spaced bands was traced for a length of 150 feet by Radiore Mines. The best assays from five trenches excavated during this previous work were 0.59% U_3O_8/5 ft. in one and 1.56% U_3O_8/2 ft. in another.

A detailed scintillometer survey was carried out by Shield Resources in this area in 1967. This survey was conducted on a 5-foot grid over most of the area from 2 + 00S to 4 + 00S and from 1 + 00W to 3 + 00W. Likewise, most of the area from 2 + 00S to 3 + 50S and from 0 + 00 to 1 + 00W was surveyed on lines spaced 10 feet apart with readings being taken each 5 feet.

The main mineralized zone in this area extends from 4 + 30S at 3 + 10W north for about 105 feet to 3 + 30S at 2 + 85W. The mineralization is associated, particularly, with magnetite- and biotite-bearing bands. Trenching on the zone gave the results listed in the following table.

Trench	Latitude	Departure	Footage in trench	Width(ft.)	MoS_2(%)	U_3O_8(%)
101	4 + 27S	3 + 10W	0-2'	2	0.75	0.164
			2'-5.3'	3.3	2.42	0.5
			5.3'-9.1'	3.8	0.15	0.046
			13.1'-14.1'	1	0.68	0.062
			22.0'-24.0'	2	2.41	0.396
102	3 + 90S	3 + 00W	0-3.5'	3.5	0.08	0.046
			3.5'-7.0'	3.5	0.09	0.084
			12.0'-15.5'	3.5	0.07	0.019
			21.5'-22.5'	1	1.24	0.42
103	3 + 47S	2 + 95W	0-2.5'	2.5	0.15	0.156
104	3 + 32S	2 + 80W	0-2.5'	2.5	tr.	0.03
			6.0'-7.5'	1.5	0.01	0.044

Trench 105 at 1 + 90S and 2 + 80W may be on an extension of this zone to the north. A sample across a width of 3 feet in this trench assayed 0.07% MoS_2 and 0.144 U_3O_8. The highest scintillometer readings in trenches 101 and 102 were 5,100 counts per second, but a reading of 5,500 c.p.s. was obtained between these trenches.

Five holes were drilled in early 1968 on this main mineralized zone in the No. 1 area. All holes were drilled in the direction N85° E and the hole locations and significant assay results are listed in the following table.

Hole	Latitude	Departure	Inclination	Depth (ft.)	Intersection	MoS_2(%)	U_3O_8(%)
11	4 + 27S	3 + 50W	61° 30'	149			
12	4 + 26S	3 + 46W	29° 30'	100	40.3'-42.3'	0.34	0.037
13	4 + 02S	3 + 52W	61°	155			
14	4 + 01S	3 + 48W	30°	104			
15	4 + 55S	3 + 48W	45°	130	89.5'-90.5'	0.23	

A narrow radioactive zone striking N20° E was investigated by trench 106 at 3 + 37S and 1 + 50W, and by trench 107 at 2 + 78S and 1 + 15W. An area 20 to 50 feet north-northeast of the latter trench was surveyed in great detail with a scintillometer.

The locations and assay results of trenching done in 1967 on a number of other radioactive zones on the property are listed in the table below.

Zone	Trench	Latitude	Departure	Footage in trench	Width (ft.)	Cu(%)	MoS_2(%)	U_3O_8(%)
4	401	1 + 08S	0 + 00	0-5'	5	0.26	0.08	0.010
				5'-8'	3	0.15	0.09	
7	701	21 + 55N	23 + 50E	0'-4'	4			0.022
				4'-8'	4			0.020
				8'-11'	3		0.02	0.026
				11'-14'	3		0.01	0.067
	702	21 + 80N	23 + 57E	0-3.5'	3.5		0.03	0.037
				3.5'-6.5'	3		0.01	0.019
	703	22 + 38N	23 + 07E	0-3'	3			0.024
				3'-6'	3			0.017
				6'-9'	3		0.02	0.025
				9'-12'	3			0.007
				12'-15'	3			0.028
9	901	1 + 96N	5 + 30W	0-5'	5		tr.	0.044
				5'-10'	5		0.03	0.005
	902	1 + 75N	5 + 30W	0-2'	2		0.04	0.007
				10'-11.5'	1.5		0.21	0.040
10	1001	1 + 54S	7 + 32E		3			0.052
11	1101	5 + 50S	0 + 00		5			0.031
					6.5			0.071
	1102	5 + 45S	0 + 25E		4			0.212
12	1201	?	?	0-5'	5			0.015
				5'-10'	5			0.007

Zone	Trench	Latitude	Departure	Footage in trench	Width (ft.)	Cu(%)	MoS_2(%)	U_3O_8(%)
	1202	?	?	0-5'	5			0.010
				5'-10'	5			0.008
				10'-13'	3			0.006
23	2301	?	?	0-4.0'	4		0.19	0.073
				4.0'-6.5'	2.5		0.11	0.166
				6.5'-9.0'	2.5			0.005
	2302	?	?	0-5'	5		0.02	0.012
				5'-10'	5		tr.	0.011
				10'-15'	5		tr.	0.012
				15'-20'	5		0.03	0.008
				20'-25'	5		0.03	0.148

Zone No. 10 is located beside a postulated fault striking about N58° E that has been termed the RA fault. Three holes were drilled along the RA fault farther to the southwest. The locations and results of this drilling are given in the table below. The holes were drilled in the direction S60° E.

Hole	Latitude	Departure	Inclination	Depth (ft.)	Intersection	MoS_2(%)	U_3O_8(%)
8	3 + 45S	2 + 49E	46° 30'	300			
16	5 + 99S	1 + 93E	46° 30'	263	60.9'-64.0'	0.37	
					179.0'-179.5'		0.03
17	7 + 00S	0 + 93E	45°	150			

The location of Zone No. 12 is unknown, but the assay results were quite low in any case. Likewise, the location of Zone No. 23 is not known. Trench 2302 is located about 35 feet southwest of trench 2301, and trench 2303 is located 20 feet south of the west end of trench 2302.

A gossan zone near DeVries Lake consists of pyrite-rich and highly siliceous rock. The zone is characterized by a negative magnetic anomaly and in places shows radioactivity of about three times background. The zone is wide at its most prominent exposure on the face of a cliff, but was traced northwest by trenching and rapidly narrows in that direction. Other similar zones are present on the property. These quartzite-like zones appear to be the result of silicification and pyritization and in places are quite strongly sheared. A zone of this type, as noted above, occurs in association with Zone 2. Sulphides, principally pyrite, form up to 15 per cent of these zones. The sulphides include minor molybdenite and chalcopyrite.

The main gossan zone noted above is located near the projection of the RA fault and was investigated by drillholes 9 and 10. These holes formed part of the drilling program carried out early in 1968 and were located at about 5 + 25S and 4 + 08E, and 5 + 11S and 3 + 18E. The holes were to depths of 171 and 205 feet, respectively, and both were inclined at 45° in the direction N82° W.

Shield Resources (DV 1-20 claims)
(86-C-7; about 64° 16'N, 116° 44'W) (Uranium)

This property near DeVries Lake was staked to cover a small radioactive occurrence and a larger aeromagnetic anomaly in a drift-covered area a short distance to the northwest. The radioactive showing consists of a remnant(?) patch of amphibolite 50 feet long and up to 20 feet wide in feldspar porphyry and banded dark acidic metavolcanic rocks. This zone was detected during the 1967 season by a helicopter-supported gamma-ray spectrometer survey. A grab sample from the showing was reported to have assayed 60.8 lb./ton U_3O_8 (The Northern Miner, Jan. 18, 1968, p. 13).

Within the amphibolite zone, which in part is highly radioactive, there is an irregular patch of greenish feldspar about 8 feet across and a lens of scapolite 3 feet long by 6 inches wide. Irregular areas in the feldspar porphyry country rock have a very dark matrix due to finely disseminated hematite and magnetite. Radioactivity is generally above background for these areas, and some bands or slightly sheared zones in the rock are moderately radioactive. Considerable interest was directed toward the larger drift-covered magnetic anomaly on the property which has some spots of high radioactivity around its margin.

PCE Explorations (UR 1-18 claims)
(86-C-12; about 64° 37'N, 117° 53'W) (Uranium)

This uranium property in the Hardisty Lake area is held under option by PCE Explorations from James Magrum of Yellowknife. This group is without doubt a restaking of a group by the same name which was investigated many years ago by UR Mines Ltd. and Gold Uranium Exploration Ltd. (Lang, 1952, p. 59). In this previous work a giant quartz vein or quartz stockwork was traced for 2,000 feet in feldspar porphyry and granodiorite. A total of about 601 feet in 10 holes was drilled on the property in 1947. A sample from the property reportedly assayed 8.63% U_3O_8.

A preliminary evaluation report was prepared on this property in 1968 by Precambrian Mining Services Ltd., Yellowknife. The general geology of the area is shown by Map 1224A (Fraser, 1967). The "giant quartz vein" is a stockwork of quartz veins which is several hundred feet wide. Showings are exposed in a number of pits and trenches for 1,500 feet along the vein on a N30° -40° W strike.

Fine pitch lende mineralization is associated with specular hematite and occurs in generally narrow and irregular quartz veins which can be followed for only very short distances. Scintillometer testing confirmed the discontinuous, localized, nature of the mineralization. Samples taken from a number of the pits and trenches gave the following assay results:

Pit No.	Sample	Width(ft.)	% U_3O_8
1	chip	4	0.157
2	chip	3	0.007
3	grab	-	0.020
4	grab	-	0.104
5	grab	-	0.012
6	grab	-	0.018

A hand-picked well-mineralized sample assayed 2.73% U_3O_8. A detailed scintillometer survey together with a program of detailed sampling has been recommended to the company.

M and M Silver Syndicate (CENT 1-12 claims)
(86-C-13; about 64° 58'30"N, 117° 44'W)

This property at Bode Lake, about 10 miles north of Isabella Lake, was apparently staked in August, 1967, as a silver prospect. Field work was carried out on the property by Orhan Baykal during the latter part of August, 1968. The claims are registered in the name of Richard Harris.

The general geology of the area is shown by Map 1224A (Fraser, 1967), which indicates that the property is entirely underlain by quartz-feldspar porphyry. However, the present mapping differs by indicating argillite, quartzite and granite on the west half of the claims, separated from porphyritic rocks to the east by a north-south fault.

Minor mineralization consisting mostly of galena, with hematite and occasional traces of silver, is present in narrow fractures apparently related to the north-south fault. It is reported that at one point the fault can be traced for a length of 200 feet as a shear 10-15 feet wide containing a 4-5 feet quartz vein along its centre. Trenching and blasting in the vicinity of the fault was tentatively recommended by the company geologist.

Syracuse Oils Ltd. and Index Construction Co. Ltd.
(ATOM 205-212 and TIN 1-36 claims)
(86-D-9; about 64° 44'N, 118° 11'15"W) (Uranium)

The TIN group was staked in late 1965 or early 1966 and covered, in part, the former CORMAC group. The two claim groups were taken under option by the above companies and a report was prepared for them by Orhan Baykal based on information available from previous work and a visit to the property in July, 1967.

The original staking on this property was in 1934 (Kidd, 1936a; Lord, 1951, p. 110). A number of pitchblende lenses and pockets are present in quartzite along or near the contact with feldspar and feldspar-quartz porphyries. Although Kidd (Map 332A, 1936a) showed a large quartz vein along the contact between sediments to the northwest and feldspar and feldspar-quartz porphyries to the southeast, it appears (Lord, 1951, p. 110) that the contact has generally been accepted as a disconformity between the sandstone which dips steeply northwest and older porphyries and dacite. Mr. Baykal considers that the contact is probably a fault which he terms the "Beaverlodge thrust". He claims this fault can be traced for 5 miles across the property and that it strikes N46° E and dips 68° NW. The showings on the property were previously described by Henderson (1949).

Consolidated Beta Gamma Mines Ltd. carried out a program consisting of 2,005 feet of diamond drilling and about 1,000 feet of drifting and cross-cutting on the property (CORMAC group) in 1955 and 1956. This work indicated an ore shoot only about 30 feet long, 10 to 15 feet wide, and with a vertical extent of about 15 feet. Intersections in this shoot gave assays of 3.03% U_3O_8 across 9 feet and 5.6% U_3O_8 across 4 feet. Diamond-drill hole

No. 14 is reported to have intersected, possibly in a separate pocket, 12 feet of ore assaying 4.4% to 9.16% U_3O_8. This ore has been reached by a raise from the underground workings.

Mr. Baykal concludes that all the pitchblende occurrences of the area are spatially related to the regional "Beaverlodge thrust", and other faults of this set, either being located in the faults or in related subsidiary fractures generally close to the major faults. He recommends a diamond-drilling program, to consist initially of 3 holes each 500 feet deep, to test the deeper potential of the shaft area and two locations within the shaft area which were not adequately tested in previous work. A program of systematic sampling and geological appraisal of all possible occurrences, and a scintillometer survey of the area are also recommended.

Other Activities in the Hottah Lake Area

Conjuror Bay Mines Ltd. are reported to hold a 50 per cent interest in the ED group of 100 claims at Beaverlodge Lake in the Hottah Lake area (News of the North, Yellowknife, Oct. 24, 1968). Airborne geophysical surveys, general prospecting and some trenching were carried out. The airborne work has located a number of areas where ground scintillometer surveys, mapping, prospecting, and possibly trenching are recommended. Structures which contain uranium showings on an adjoining property are reported to extend onto the ED group.

Barons Oil Ltd. acquired the HBC 1-20 group of claims (86-D-9) in September, 1966. These claims are at the east end of Arden Bay on Beaverlodge Lake and adjoin to the east of the TIN group. The TIN group is, in part, a restaking of the CORMAC group and forms part of a property held jointly by Syracuse Oils Ltd. and Index Construction Co. Ltd. No work is known to have been carried out by Barons Oil on their property.

American Uranium Ltd. holds 200 claims in the general Hottah Lake area which are considered to hold prospects for uranium and copper deposits. Work is planned for the 1969 season.

Bell-Can Explorations Ltd. (BC 1-35 claims) (86-F-4; about 65° 12'N, 117° 39'W) (Uranium)

Radioactive showings were investigated on this property August 24-27, 1968. The claims are largely underlain by pink granite. Uraninite and secondary uranium minerals occur in shear and fracture zones a few inches wide and up to 10 feet long. The showings were investigated by three pits and by scintillometer reconnaissance in their vicinity.

Garnetiferous amphibolite, which contains trace amounts of molybdenite, pyrite and chalcopyrite, is present along some of the radioactive fractures. Numerous vertical quartz veins, with strikes of about N30° E, are present across a width of 50 feet in the vicinity of the main showing. These quartz veins were found to be barren.

Six samples from the showings gave assay results of 0.011, 0.076, 0.010, 0.968, 0.860 and 0.050% U_3O_8. Which of the claims covers the main showings is not known.

Plateau Metals (Ellington Lake-Zebulon River area)

A two-man crew, starting in mid-July, 1967, undertook a reconnaissance investigation of feldspar and feldspar-quartz porphyries in this area, and possibly at other localities farther to the north. The exploration camp on an unnamed lake at about 67° 11'N, 110° 56'W was visited on July 28. The porphyritic rocks of this area have been mapped as probably extrusive (Lord, 1952) and, as seen from the air, the sequence has shallow to moderate dips and appears to form a shallow basin. These rocks are in part fragmental and are associated with volcanics which include rhyolite, dacite, andesite, tuff and agglomerate. It is possible that the porphyritic rocks are largely ignimbritic in nature.

King Resources (Marian River-Wopmay River-Camsell River area)

A reconnaissance airborne scintillometer survey for uranium was carried out in this general area by J. D. Mason during the 1968 season using a Cessna 180 aircraft. Selected areas, probably picked on the basis of structural considerations and proximity to known radioactive occurrences, were flown from Marian Lake north at least to Grant Lake. Late in the season a survey was flown over the property of Jason Explorers at Rainy Lake on the Camsell River.

The equipment being used was manufactured by Sharpe Instruments and included a single detecting crystal. Single channel recording of uranium and thorium, with potassium eliminated by the sensitivity control, was carried out. Any anomalies obtained could be reflown with the instrument adjusted to eliminate the response to thorium.

At the time the field camp was visited on Grant Lake (approx. 64° 54'N, 116° 30'W) on August 14 approximately 5,000 line miles of survey had been flown.

Pine Ridge Exploration Co. Ltd. (KNOB and KNOBHILL claims)
(86-F-6; about 65° 23'25"N, 117° 07'50"W) (Copper, Tungsten)

This property in the Lever Lake area was staked by S. Yanik as the 12-claim MEASIN group in 1962. The surface mineralization and general geology has been summarized by Baragar and Hornbrook (1963, p. 32). The property subsequently lapsed and was restaked by Mr. Yanik in 1966 as the KNOBHILL 1-5 and KNOB 6-20 groups. The property was taken under option by Pine Ridge Exploration Company early in 1967 and a program of trenching, electromagnetic surveying, shallow diamond drilling, and, subsequently, deeper drilling was carried out. An exploration program had been recommended on the property by Precambrian Mining Services, Yellowknife.

The No. 1 zone on claim KNOBHILL 4 has a reported length of 1,600 feet and sampling of 4 trenches on the zone gave values up to 9.60% Cu and 0.56% WO_3 (The Northern Miner, July 27, 1967, p. 7). Three trenches along a 400-foot length averaged 2.96% Cu and 0.54% WO_3 across an average width of 5.7 feet.

A program of shallow drilling with a Winkie drill was carried out on the No. 1 zone with results as follows:

Hole No.	Inclination	Depth(ft.)	True width intersected	Cu(%)	WO_3(%)	Au(oz./ton)
K1-01		28				
K1-02	72°	28	4.8	0.58	tr.	tr.
K1-03	59°	28	5.4	1.45	tr.	tr.
K1-04	43°	44.3	5.0	0.48	tr.	tr.
K1-05	50°	44	8.3	1.09	tr.	tr.
K1-06	51°	30	5.0	2.01	tr.	tr.
K1-07	70°	60.5	9.5	2.85	tr.	0.02
K1-08		37				
K1-09	60°	59	10	1.59	0.01	tr.
K1-10	55°	58.5	5.2	2.42	0.27	tr.
K1-11	50°	49.5				
K1-12	65°	65	6	6.85	0.14	tr.

Holes 1 and 8 were lost before penetrating the zone and hole 11 failed to make an intersection. The holes were drilled along a length of 460 feet. Calculations based on these shallow holes and the trenching results indicated an average grade of 3.43% Cu to a depth of 30 feet for a zone 235 feet long and an average width of 6.35 feet. An alternate calculation including the above zone but extending farther west indicated 2.50% Cu to a depth of 30 feet over a length of 461 feet and an average width of 5.15 feet.

On the basis of these results a program of deeper drilling was decided upon and was carried out September 22 to October 15, 1967. Five holes were drilled along a length of about 400 feet with results as follows:

Hole No.	Inclination	Depth (ft.)	Intersection From	To	Sample width(ft.)	Cu(%)	WO_3(%)	Au (oz./ton)
K1-13	45°	286	222.8	229.7	6.9	0.07	tr.	tr.
			229.7	233.0	3.3	0.21	tr.	tr.
			267.5	277.5	10.0	1.26	tr.	tr.
K1-14	45°	302	233.0	236.0	3.0	0.05	tr.	tr.
			236.0	239.4	3.4	0.26	tr.	tr.
			239.4	241.7	2.3	0.01	tr.	tr.
K1-15	45°	202	129.7	133.7	4.0	1.08	tr.	tr.
K1-16	50°	251	153.5	155.5	2.0	0.78	tr.	0.01
			199.6	202.6	3.0	0.07	tr.	tr.
			202.6	206.6	4.0	0.05	tr.	tr.
			206.6	210.6	4.0	0.05	tr.	tr.
K1-17	60°	280	No samples taken.					

The total diamond-drilling program for the season thus consisted of about 1,850 feet. The deeper diamond drilling was, obviously, very disappointing. No further work has been done on the property although the property was subsequently purchased from the optioner for $20,000 (The Northern Miner, Jan. 9, 1969, p. 19).

CAMSELL RIVER AREA

Exploration in this area was almost exclusively for silver deposits. This exploration in the general Great Bear Lake area was spurred by an increase in the price of silver and the very profitable silver production by Echo Bay Mines at Port Radium. The property of Terra Mining and Exploration in the Camsell River area (described as a developing mine at the end of this report) was staked during the summer of 1966. Exploration in the vicinity of the Camsell River was greatly increased in 1968 after favourable drilling results had been obtained on the Terra property. In 1968 some development was done on the old Camsell River Silver Mines property (Silver Bay Mines) and drilling was done on silver-bearing veins on the ITLDO claims (Caesar Silver Mines).

Silver Bay Mines Ltd. (LM 1-8 claims)
(86-F-12; about 65° 35'45"N, 117° 58'40"W) (Silver)

This property was formerly held by Camsell River Silver Mines, and was developed by an adit, drifts and a winze. The LM group covers at least part of the former OTTER and AVG groups including the main veins and underground workings (Lord, 1951, p. 91).

The general geology of the area has been mapped by Lord (1952). The property is largely underlain by andesites which form a north-south belt in the area. The andesites and associated feldspar and feldspar-quartz porphyries belong to the Echo Bay Group.

The No. 1 vein consists of quartz and quartz-carbonate veins along a shear-breccia zone striking N57° W in the andesitic volcanic rocks. This vein has been explored on surface for a length of 1,000 feet. The minerals contained in the vein have been reported to include silver, argentite, pyrite, arsenopyrite, chalcopyrite, galena, sphalerite, niccolite, other arsenides, bismuth and bismuthinite. Three samples taken in 1946 or early 1947 from the drift on the No. 1 vein indicated an average grade of 41.9 oz./ton Ag across a width of 10 inches and for a length of 100 feet. This suggested the possible presence of 550 tons of ore above the first level and 170 tons to a depth of 25 feet below the level with a total content of 30,096 ounces of silver.

In 1947 26 X-ray holes totalling about 1,700 feet were drilled on the veins on the property, 14 of them on the main vein. This drilling outlined an ore shoot 250 feet long and 46 inches wide with an average grade of roughly 34 oz./ton Ag. The main zone on the property apparently contains some pitchblende locally and a sample from where the adit intersected the vein is reported to have assayed 7.38 oz./ton Ag and 0.226% U_3O_8 (Lang, 1952, p. 56). Holes 7 to 16 in the 1947 drill program tested the No. 1 vein for a length of 225 feet starting from a point 200 feet northwest of the most southeasterly exposure of the vein beside the Camsell River and extending to the northwest. These drillholes gave the following intersections (see page 79).

Old workings on the property were established by White Eagle Mining Co. in the early 1930s. An adit extends about 60 feet north from beside the Camsell River and then turns northwest to follow the No. 1 vein for a distance of about 490 feet. From perhaps 200 feet northwest of the junction of the adit with the No. 1 vein a crosscut was driven northeast for a distance of 105 feet. From this crosscut, at a distance of about 50 feet from the main drift, a winze was sunk to a depth of about 125 feet.

Hole No.	Core length (inches)	Silver (oz./ton)
7	22	0.67
8	30	8.16
9	56	15.65
10	60	7.37
11	50	7.49
12	45	2.32
13	52	2.42
14	48	318.00
15	19	2.05
16	47	0.59

Fred Lypka and associates were active on the property during the 1967 season. They mined some material from the surface along the main vein on the property and bagged an estimated 4 to 6 tons of silver ore. Part of the bagged material is silver rich and is no doubt very high grade. In some of the material abundant native silver in small grains is disseminated throughout granular translucent quartz in veins a few inches wide. Niccolite and galena are fairly common in the material which was mined, and it is to be noted that these minerals are very closely associated and that they are later than the grey Co-Ni-Fe arsenide minerals. Some native silver is generally found in association with the niccolite.

The main vein was tested by Geiger counter when the property was visited on July 28, 1967, with negative results, although a significant uranium assay has been reported for a sample from the underground workings. A parallel arsenide-bearing vein, the No. 2 vein, located about 600 feet to the northeast was found to be moderately radioactive in places.

A shipment consisting of most of the bagged ore was later reported to have averaged 438 oz./ton Ag (The Northern Miner, June 13, 1968, p. 7). Ten sacks of rejects sent out for assay by Silver Bay Mines early in the 1968 season assayed an average of 34.5 oz./ton Ag.

Prior to the 1968 season F. Lypka, registered owner of the property, granted an option on the property to Grayling Mines. The property was investigated during 1968 by Silver Bay Mines, but the nature of the agreement between these two companies is not known. The property was visited by the author on May 16, July 13 and August 14, 1968.

As of May 16 an adit had been driven about 80 feet north to intersect the old drift on the No. 1 vein at an estimated distance of 100 to 120 feet northwest of the mouth of the old adit. Slashing was then done for some distance northwest along the vein in order to permit use of a rubber-tired loader-trammer.

The No. 1 vein dips about 70° northeast. Trenching of the vein on surface was reported to have yielded assays of 35 to 10,000 oz./ton Ag across an average of 3 feet for a length of 127 feet (The Northern Miner, June 13, 1968, p. 7). On the drift level a length of 15 feet below this mineralized section was reported to have given very high assays.

Raises had been put up at either end of the wedge-shaped ore shoot prior to my visit on July 13. The most northwesterly raise goes directly up to surface, approximately 90 feet vertically, in the plane of the vein. The second raise, likewise in the plane of the vein, starts at a point 25 feet southeast of the first and a short distance above the drift it hooks back to the southeast at about 45° so that the two raises enclose the known extent of the ore

shoot. The second raise apparently reaches the surface at 60 to 70 feet above drift level. Sampling of the raises was reportedly done at 5-foot intervals with assay results indicating grades of 20 to 450 oz./ton Ag across a width of 3 to 4 feet. Forty samples taken from raise muck were reported (The Northern Miner, June 27, 1968, p. 2) to have averaged 564 oz./ton silver.

Work was being done on dewatering the old shaft (winze) and a depth of 70 feet had reportedly been reached. The winze goes to a depth of 120 or 125 feet with an old level at a depth of 100 feet. Drifting had been done on the vein on this level for a length of 300 feet.

A diamond-drill hole had been collared about 110 feet northeast of the No. 2 vein and was being drilled southwest at an inclination of 45° to intersect this vein. The hole had reached a depth of 161 feet at the time of my visit but had not penetrated the vein. The No. 2 vein at this location is cobalt-rich, about 1 foot wide, and appears to dip about 75° to 80° southwest.

Caesar Silver Mines Ltd. (ITLDO 1-13 claims)
(86-F-12; about 65° 35'N, 117° 58'W) (Silver)

This claim group is located near the Camsell River and just south of the property of Silver Bay Mines. The group covers silver-bearing arsenide veins on the former F and H No. 1 claim (Lord, 1951, p. 93). Silver, argentite, chalcopyrite, galena and arsenides occur with quartz and carbonate in three fractures up to 1 foot wide and 550 feet long. These fractures vary in strike from east to southeast and occur across a width of 300 feet in feldspar-quartz porphyry. The mineralization within the fractures was reported to occur only near a late diabase dyke that is 6 feet in width.

A program consisting of 9 diamond-drill holes was conducted on the property in March and April, 1968, by Titan Drilling Ltd. Seven additional holes were drilled during May and June. Late in the season a summary report of the results of the drilling programs was prepared by Dolmage, Campbell and Associates. The property was visited by the author on August 14, 1968.

The main vein on the property was tested by 10 drillholes and the data for these are recorded in the following table. These holes were collared very close to a single east-west line and were drilled to test east-west silver-bearing veins that had been previously investigated by a number of trenches and a shallow shaft. Holes 15 and 16 are exceptions to the linear distribution of holes, they were apparently both drilled from a site about 25 feet south of hole No. 6.

Holes 4, 5 and 8 were drilled in a single section passing through the shaft. In fact it appears that hole No. 8 passed through the shaft opening and thus failed to intersect the vein intersected by holes 4 and 5 beneath the surface opening of the shaft. A diabase dyke striking N10°-15°E is exposed about 40 feet west of the shaft. Hole No. 9 was apparently drilled parallel to and about 5 feet west of the west contact of this dyke. This hole failed to give any interesting assays. Hole No. 6 failed to intersect the veins.

The intersection in hole No. 7 has been reported to grade 441 oz./ton Ag for a core length of 30 feet from 88 to 118 feet in the hole (Western Miner, June 1968, p. 19). This information is misleading, however, since ore-grade material is restricted to the interval 99 to 119 feet in the hole.

Traces of native silver were reported at 100-111 feet in hole No. 13 and at 120 feet in hole No. 14. However, no assay results are available for these drillholes.

Hole No.	Distance east/west	Azimuth	Inclination	Depth (ft.)	Intersection	Core length(ft.)	Ag (oz./ton)
4	0	180°	45°	125	31'8"-31'10"	0.16	2458.3
					31'11"-38'	6	1.10
					52'-60.5'	8.5	4.80
					60.5'-65'	4.5	42.1
5	0	180°	60°	125	86'-91'	5	2.50
6	90'E	230°	?	26			
7	45'E	180°	45°	248	56'-62'	6	12.3
					62'-66'	4	2.2
					88'-93'	5	2.1
					93'-98'	5	0.85
					99'-101.5'	2.5	916.2
					112'-117'	5	1.40
					117'-119'	2	5410.1
8	0	180°	45°	129	58'-66'	8	355.7
9	65'W	190°	?	150			
13	70'E	180°	45°	176			
14	70'E	180°	60°	197			
15	92'E	180°	45°	197	4'-8'	4	36.4
					8'-11'	3	3.15
16	92'E	180°	60°	148	86'-91'	5	2.05

The drilling indicated two subparallel veins about 6 to 12 feet apart. The widths of the veins and the contained silver values are extremely erratic. The quartz-carbonate-sulphide vein-fracture zones strike about east-west and apparently dip steeply to the south.

Assay results are available for lead, and in a few cases for copper, for intersections in holes 15 and 16. These assay results are as follows:

Hole No.	Intersection	Core length(ft.)	Ag(oz./ton)	Pb(%)	Cu(%)
15	8'-11'	3	3.15	3.53	
	32'-36'	4	1.75	0.23	1.85
	182'9"-191'	8ft. 3in.	0.45		1.40
16	3'-7'	4	0.35	3.15	
	7'-12'	5	1.00	3.37	
	12'-17'	5	0.95	5.45	
	17'-21'	4	0.40	5.88	
	86'-91'	5	2.05	3.74	

A zone about 200 feet wide and 1,000 feet long east and south of the main silver-bearing veins has irregularly developed rusty or gossan areas throughout. This zone consists of volcanic rocks which have been extensively fractured and mineralized locally. Assays of 3.00 and 8.65 oz./ton Ag were obtained over unspecified widths in one of the gossan areas near the south end of the zone. Three holes, Nos. 17-19, totalling 656 feet were drilled in this area but failed to indicate any zones of significant mineralization.

Holes 1-3 were drilled on the gossan zone to the east of the shaft area. These holes were drilled at a single site and were fanned at 120° to each other. The three holes were samples at 5-foot intervals for their complete length. Assay values ranged from trace up to about 0.5 oz./ton Ag with the exception of two intersections. The two better-grade intersections were as follows:

Hole No.	Depth(ft.)	Intersection	Ag(oz./ton)
1	311	260'-265'	2.00
2	250	105'-110'	5.30

Further work on the property to consist of detailed geological mapping in the vicinity of the veins, geochemical soil sampling for copper and silver, and diamond drilling was recommended by Dolmage, Campbell and Associates Ltd. The first diamond drilling is recommended to trace the main mineralized vein to greater depth. Further investigation of the gossan zone was recommended as part of any future exploration on the property.

Caesar Silver Mines Ltd. (AG 1-13 claims)
(86-F-12; about 65° 34'15"N, 117° 58'W)

This property is near Camsell River and immediately south of the ITLDO group, which is held by the same company. A magnetometer survey was done over claims AG 2-7, 10 and 11 in August, 1968. The survey was done with a vertical field fluxgate magnetometer along lines spaced 500 feet apart and covered a total of 6 line miles. The most westerly survey line was most anomalous, but the survey apparently failed to indicate the presence of significant anomalies on the property.

Caesar Silver Mines Ltd. (PRE and other claims)
(86-E-9; about 65° 34'30"N, 118° 00'45"W)

This property is located in the Camsell River area and consists of claims PRE 2, 3, HRB 2, RMK 2, SEH 2, ALE 3, MCG 2 and GWP 2, a total of 8 claims. This group of claims is in the Camsell River area about one mile west of the ITLDO and AG claim groups, which are held by the same company.

A magnetometer survey, using a vertical field fluxgate instrument, was conducted on the property by Klyceptor Surveys Ltd. in late October, 1968. The survey was done on north-south lines spaced 400 feet apart, with readings each 100 feet, and covered a total of about 9.5 line miles. Magnetic gradients appear to have been treated as anomalies, and this results in the definition of 9 anomalies. It was suggested that most of the anomalies are related to faults or fractures, which are considered to be magnetite-bearing. One anomaly was tentatively related to topographic features.

Caesar Silver Mines Ltd. (WOLF and other claims)
(86-F-12; about 65° 34'45"N, 117° 55'45"W)

This property consists of claims WOLF 9, 10, GWP 1, RMK 1, HRB 1, MCG 1, BAR 1, ALE 1, SEH 1 and PRE 1, a total of 10 claims. These claims adjoin to the east of part of the ROSE group and to the east and southeast of the ITLDO group of claims.

A ground magnetometer survey of the property was done by Klyceptor Surveys Ltd. in late October, 1968. A vertical field fluxgate type of instrument was used. The survey covered approximately 10 line miles along lines spaced 200 feet apart and with station intervals of 100 feet. Gradients in magnetic intensity appear to have been treated as anomalies. Northwest-southeast trending anomalies were mapped in the southern part of the area, and it was suggested that these are associated with magnetite in shears or fractures.

L. Hanson (24 claims)
(86-F-12; about 65° 38'35"N, 117° 52'45"W)

Mr. Hanson owns the AJR, SEH, LRL, PA, ASAC and U groups, each of 4 claims, in the Belachey Lake area. The property is a uranium prospect.

A magnetometer survey totalling 12 line miles was carried out by Klyceptor Surveys Ltd. on the property in August, 1968. A vertical field fluxgate instrument was used to measure stations at 100-foot intervals along east-west lines spaced 400 feet apart. The survey covered all or part of 18 claims and the results were plotted as profiles with 56,000 gammas as an arbitrary base. Magnetic gradients, regardless of the direction of decrease of the magnetic field, were connected from line to line to give a number of linear anomalies.

Fred Lypka (PEF 3-20 claims)
(86-F-12; about 65° 39'30"N, 117° 51'W) (Silver)

This property at Balachey Lake, about 2 1/2 miles north of White Eagle Falls on Camsell River, was staked by Fred Lypka in August, 1966, as a silver prospect. The claims are a restaking of parts of the former TOLEDO, JOYCE and PETER groups.

A mineralized zone, possibly occupying a fold structure, is reported on the property. The zone contains seams of pyrite and chalcopyrite and is exposed across a width of 10 to 20 feet, although the total width of the zone is also reported to be present on the property. The general geology of the area is given by Lord, 1952.

Three short holes, 40, 50 and 50 feet in length, were drilled on the property in 1967. Two of the holes reportedly penetrated 25 feet of quartz mineralized with pyrite, chalcopyrite and specular hematite before passing into greenstone, and the third apparently intersected only vein material. The quartz vein in greenstone was also investigated by 10 pits along a length of 1,350 feet.

The results of 6 assays of unreported location are as follows:

Ag(oz./ton)	Au(oz./ton)	Co(%)
10.70	tr.	0.84
1.64	0.01	1.80
0.02	0.12	0.72
tr.	tr.	
nil	0.06	
tr.	0.10	

International Mine Services Ltd. (ROSE 1-36 claims)
(86-F-12; about 65° 30'N, 118° W) (Silver, Copper)

This property is located on Camsell River near the Camsell River Silver Mines property. The claims were recorded on August 8, 1965.

In November, 1966, an electromagnetic survey was conducted over a very small area on the property. This survey was performed by Sander Geophysics Ltd. No anomalies were detected by this work.

Geological mapping was done on the property, with the exception of claims ROSE 8, 15, 19 and 21, during the 1967 season at a scale of 600 feet to the inch. Quartz-feldspar porphyry is apparently the predominant rock type exposed on the property. It was suggested that the porphyry may be the time equivalent of intermediate volcanics of the Echo Bay Group, which are also exposed on the property. These rocks are cut by dykes and larger bodies of granitic rocks.

The rocks are cut by shears with strikes from north to northwest, predominantly in the latter direction. Quartz and quartz-carbonate veins from a few inches to 2 feet wide are present on the property, most commonly along the dominant northwest shears. Pyrite, pyrrhotite, chalcopyrite, malachite, erythrite, hematite, magnetite, galena, sphalerite, bornite and chalcocite were observed on the property and are largely restricted to the quartz and quartz-carbonate veins or the host shear zones. Minute quantities of native silver were noted on claim ROSE 3. Malachite and minor chalcopyrite occur locally in numerous irregular fractures in the granite. Encouraging copper assays were obtained for samples from claims ROSE 21 and 27. A gossan zone 100 to 150 feet wide trends northwest along the length of claim ROSE 11. Some pyrite and grey arsenides were noted in association with this gossan zone.

An electromagnetic survey was recommended in the vicinity of the best showings, over northwest-striking shear zones, and over the gossan zone on claim ROSE 11.

Jason Explorers (MAG 1-72 claims)
(86-E-9, 86-F-12; about 65° 36'N, 118° 08'W)

A two-phase program of exploration was recommended for this property by N. C. Lenard (Western Miner, Apr., 1968, p. 248). Prospecting and trenching was carried out on the property during the 1968 season by a crew which arrived on the property on May 25. An electromagnetic survey was supposed to have been carried out on the property, but it is not believed

that this work was done. The prospecting indicated the presence of some bornite, hematite and chalcopyrite-pyrite veins. Trenching was carried out on some of the latter veins.

Minor pitchblende and gummite were discovered on claim MAG 68 in the northeast part of the property. This mineralization occurs in tight fractures in sheared feldspar porphyry which is in contact with a diabase dyke. Heavy galena and pyrite mineralization is reported to occur over a width of 12 feet in the same zone, which gives only low assay values for silver.

An airborne scintollometer survey was flown over the property September 13-15. The flying was along north-south and east-west lines spaced at 1/4 mile intervals. A Cessna 180 aircraft was used and the flying was at an elevation of about 100 feet and a speed of about 100 miles per hour. The equipment used consisted of a scintillometer, manufactured by Sharpe Instruments, with a 4 inch by 6 inch detecting crystal, plus a chart recorder. Approximately 90 line miles were flown in the survey. No anomalies were detected which were considered to be significant.

Geophysical work and further prospecting were planned for the 1969 season (The Northern Miner, Oct. 24, 1968, p. 7).

International Mine Services Ltd. (X claims)
(86-E-9; about 65° 36'30"N, 118° 06'45"W)

This property is in Camsell River area and adjoins to the north the property of Terra Mining and Exploration. Geological reconnaissance was done on the property in late July, 1967. A geological map of claims X4-11, and of a small part of claim X3, was prepared at a scale of 600 feet to the inch. The claims are underlain by andesites and feldspar porphyries of the Echo Bay Group. All the gossans and the sparse copper mineralization are confined to the feldspar porphyries. Minor chalcopyrite was observed in one old trench. Another old trench 50 feet long by 5 feet wide in a gossan zone was sampled, but very discouraging assays were obtained.

Magnet Explorations (BELL 1-9)
(86-E-9; about 65° 36'N, 118° 08'W)

This property in Camsell River area is a silver prospect which adjoins the property of Terra Mining and Exploration, on which development work was carried out in 1968. Acquisition of the property was announced in November, 1967. Preliminary traversing of the property had indicated that it was underlain by massive feldspar porphyries. These rocks are apparently extrusive or pyroclastic (an ignimbrite sequence) rocks of the Echo Bay Group which form a northwest-striking and steeply dipping belt about 3 to 5 miles wide. Faults and shears on the property belong to northeast-southwest and northwest-southeast sets. At least three major faults cross the property.

An electromagnetic geophysical survey was carried out on the property in late February or March, 1968. The survey was carried out in three selected areas and covered only 1.7 line miles. A conductive zone, subparallel to and very close to a known major fault, was outlined in the northeast corner of claim BELL 4 and may extend east onto claim BELL 5. The

zone was covered by overburden and a drilling program to consist of three holes each 300 feet deep and detailed prospecting were recommended.

Drilling was started on the property on May 15 and it is assumed that the program was carried out as recommended and that the results were negative.

Conjuror Bay Mines Ltd. (COP 1-50 claims)
(86-E-9 and 86-F-12; about 65° 37'N, 118° 00'W)

W. L. McDonald, Yellowknife, recommended a program of trenching and electromagnetic surveying on the property in a report prepared early in the 1968 season. Personnel went to the property early in February to start line-cutting and other preparations for the season's work.

Electromagnetic and magnetic surveys were completed on the property by mid-April by Anglo-Celtic Explorations of Yellowknife. A Ronka EM 16 electromagnetic unit and a Sharpe MF-1 fluxgate magnetometer were used. The work was carried out on about 50 line miles of grid. The east-west baseline for this work was 16,400 feet long and the grid lines, spaced 400 feet apart, ran an average of 3,000 feet north and south from the baseline. The magnetometer survey indicated a series of magnetic highs, over a maximum width of 3,000 feet, which trend west-northwest across the property. Most of these magnetic highs are due to a band of andesite. None of the magnetic highs correlated with 14 conductors indicated by the EM survey.

The electromagnetic conductors obtained in the Ronka EM 16 survey were checked by a Sharpe SE 300 electromagnetic instrument in a survey carried out June 20-23, 1968. This work indicated all of the anomalies to be false. The higher magnetic anomalies were also checked without any conductors being indicated.

As is the case for the property of Terra Mining and Exploration and others in the area, adequate geological maps are not available. The preliminary geological mapping by the company during the 1968 season indicated that bands of andesite tuff trend northerly through the eastern end and the central portion of the claim group. These bands are the two limbs of a syncline which closes south of the COP claims on the property of Silver Bay Mines. Feldspar and feldspar-quartz porphyries are present within the syncline and on the western part of the property. Some conglomerate was noted in the southwestern corner of the property. These rocks are considered to belong to the Echo Bay Group. A granite mass which is intrusive into the andesite has been mapped on claims COP 29, 30, 31 and 32.

A zone of mineralization extends in a westerly and northwesterly direction through claims COP 14, 15 and 21 for a length of about 2,200 feet. One part of the zone on claim COP 14 had been previously investigated by several pits. Following completion of the geophysical surveys prospecting extended the poorly defined zone to the east, with malachite and chalcopyrite sporadically present along its length. The eastern part of the zone contains chalcopyrite, malachite, erythrite, galena, arsenopyrite, and pyrite associated with a narrow band of quartz and carbonate. This part of the zone lies near the contact with an east-west basic dyke and adjacent to this is an area of pink porphyry containing disseminated chalcopyrite and pyrite.

A grab sample from the vein is reported to have assayed 1.3% Co, 0.22% Cu, trace Ag and 0.03 oz. Au. Three other samples from the vein gave 0.07 to 0.63% Co, up to 0.19% Cu, 0.21 to 0.42 oz./ton Ag, and a trace

to 0.06 oz./ton Au. These results are not too encouraging, but the company plans to continue work along and adjacent to the zone of mineralization. This work will include prospecting, geological mapping and geophysical surveys. A photogeologic study will also be carried out.

Jimrock Mines Ltd. (AN 1-53 claims)
(86-E-9; about 65° 38'N, 118° 10'W)

This property is located in the Camsell River area and was investigated in a preliminary manner by magnetometer and electromagnetic surveys in August, 1968. Lines spaced at 500-foot intervals, with stations each 100 feet, were surveyed by Klyceptor International Air Surveys Ltd. in a program which totalled 44 line miles. Detailed surveys with closer station spacing then covered an additional 18 line miles. A fluxgate magnetometer and a Ronka EM 16 instrument were used.

The general geology of the area (Brown, 1958) is only very poorly known due to the brief reconnaissance nature of the investigations by Kidd (1936b) and Bell (1902).

A number of prominent linear magnetic anomalies, some with coincident conductive zones, were indicated by the geophysical surveys. Trenching reportedly indicated that magnetite-bearing veins were responsible for the magnetic anomalies. The electromagnetic survey was considered to have indicated five zones of interest. Sulphide-bearing quartz "formations" are also reported to be present on the property and apparently account for some of the conductive zones. A total of 16 trenches were blasted in these conductive zones with generally discouraging results. The effects of leaching on the assay values are emphasized, but these are probably exaggerated. The No. 1 zone is reported to have given assays as high as 6 per cent copper from trenches on its western section. A drill program has been recommended for this zone and thorough geological investigation of the other four zones. The company proposes to carry out a program of geophysics and diamond drilling in 1969.

Silver Point Mines Ltd. (SID 1-13 and DIM 1-16 claims)
(86-E-9; about 65° 34'N, 118° 09'W)

Prospecting and trenching was carried out on this property in 1968 by the exploration crew which worked for most of the season on the property of Jason Explorers. The results of this work are not known. The property covers possible extensions to the northwest of the vein system on the property of Terra Mining and Exploration. Further exploration is planned for the property in 1969. The company is 96 per cent owned by Slave Point Mines Ltd.

GREAT BEAR LAKE AREA, GENERAL

Some attention was devoted to silver and uranium showings in the area, but more exploration was concentrated on the investigation of copper-bearing veins. Copper mineralization associated with "giant" quartz veins or quartz stockworks were investigated by Mariner Mines and by Anaconda Petroleums. Drilling was done on the property of Mariner Mines.

El Bonanza property (BONANZA claims)
(86-L-1; about 66° 00'20"N, 118° 05'W) (Silver)

This property was re-activated in 1965 and a crew, under the direction of George Midgley, added approximately 300 tons of ore to the previous stockpile (Thorpe, 1966). The crew left the property early in 1966. Plans to transport the stockpiled ore to Port Radium for milling by Echo Bay Mines did not materialize. A mill of 30 to 40 tons per day capacity was also under consideration for the property (The Northern Miner, Mar. 10, 1966, p. 19), but no further work has been done on the property to the end of 1968.

LUCK 1-81 claims (86-K-4; about 66° 03'N, 117° 58'W)

This property in the Port Radium area is held as a silver prospect by a syndicate based in Portland, Oregon (J. F. Gillham, Trustee). Geological mapping of the property was carried out in 1968 by Precambrian Mining Services Ltd. at a scale of 1,000 feet to the inch, although an unpublished map of the area at 500 feet to the inch prepared by Thurber (1946), of the Geological Survey of Canada, was available.

The claims north of Echo Bay are underlain by intermediate volcanics and their metamorphosed equivalents. These rocks are intruded by granodiorite and related rocks, which also underlie most of the claim group lying south of Echo Bay, and all rocks are intruded by later diabase and gabbroic dykes. The volcanics include flows and agglomerates. Cherty argillite and arkosic conglomerate (?) are associated with the volcanics.

The structure of the area is very complex. Faults, shear zones, contacts, and joints were checked closely for radioactivity. A large number of gossans are present on parts of the property, but sampling failed to reveal any economic sulphides or silver minerals.

Mariner Mines Ltd. (FIN, FUN, NOR, CM and BEVIS claims)
(86-K-4; about 66° 13'10"N, 117° 36'45"W) (Copper)

The complete list of claims held by the company at the end of 1968 is not known, but probably includes claims FIN 1-45, FUN 1-7, NOR 1-30, CM 1-24 and BEVIS 1, 2, 10-13, 21-36. This property lies about 15 miles northeast of Port Radium. The general geology of the area is given by Map 18-1960 (Fraser, 1960) and by a map at 4 miles to the inch prepared by Eldorado Mining and Refining Ltd. (Open File 4, Geol. Surv. Can.). The property is within an area of quartz-feldspar porphyry which also includes flows of the Cameron Bay Group and flows and sediments of the Echo Bay Group.

A program consisting of preliminary prospecting, trenching, and shallow diamond drilling was carried out on the property in 1968. A 6-man crew arrived at the property on July 1 to start the exploration. The work was primarily designed to test a copper occurrence discovered in 1930 and staked at that time by Dome Exploration. Grade of this discovery had been visually estimated at about 7% Cu and mineralization was present across an average width of 6 feet and a length of 600 feet.

Diamond-drilling equipment, except for an engine, were present on the property when a brief visit was made on July 14. Drilling with a small rig was in progress on August 14 when the property was again visited.

The main showing consists of bornite-chalcopyrite mineralization in a somewhat sheared quartz vein or quartz stockwork which strikes northeast. At the east end of the showing the quartz vein pinches out in diabase, although it continues again farther to the east. A very few feet west of the east end of the mineralized section the quartz vein is about 10 to 12 feet wide including a width of 3 1/2 feet of heavy bornite mineralization. Another trench a short distance west of this shows considerably less mineralization. The vein is then covered by overburden for some distance and two trenches in this interval failed to reach bedrock. A trench located about 240 feet west of that containing the heavy bornite mineralization, contains some copper mineralization. Here the quartz vein or quartz stockwork (only highly altered fragments remain in the nearly massive quartz) is 75 feet wide. Diabase is exposed a short distance north of the vein. Drilling was being done to intersect the vein at this location. A few pits farther west show minor to moderate copper mineralization across narrow widths. The quartz vein is reported to continue to the west and some malachite staining is evident. The overall picture thus appears to be that high-grade lenses of bornite and chalcopyrite, a few tens of feet long and probably never more than 100 feet long may be present and that these can be expected to be as discontinuous vertically as they appear to be laterally. Much lower grade mineralization, predominantly chalcopyrite, appears to persist over a much greater length of the vein but, likewise, can be expected to vary greatly in grade and width both laterally and vertically.

The company reported (The Northern Miner, Aug. 29, 1968, p. 1) that the mineralized zone had been traced for a length of 700 feet and appeared to be 6 to 8 feet wide and to average about 6 to 8% copper. The property had been enlarged to about 200 claims at this time. Plans for a geophysical survey were reported but it is not known whether or not this work was done. Plans were also announced for a regular drilling program. The last two holes completed with light drilling equipment gave intersections of 3.03% Cu/7 1/2 ft., including 4.25% Cu/5 ft., and 3.5% Cu/11 ft., including 7.2% Cu/5 ft. (The Northern Miner, Oct. 24, 1968, p. 17).

A contract was let for 2,500 feet of drilling and the program started December 8, 1968. The first hole was drilled beneath the area in which the shallow intersections reported above were obtained. This hole intersected the zone at a depth of 50 feet and gave an assay of 3.75% Cu across 14.7 feet (The Northern Miner, Jan. 9, 1969, p. 11). The next hole was to intersect the zone at a depth of 100 feet, with subsequent drilling to test the zone at 50-foot intervals along its length. Nine holes were completed by early January, 1969, of which three were abandoned in a fault zone. Hole No. 4 obtained an intersection, starting at 80 feet in the hole, with a grade of 2.3% Cu/24.2 ft., including 8.5% Cu/2.7 ft. Hole No. 8 cut a 50-foot section described as well-mineralized. Assays were being awaited on core from four holes at the time of the above report. The 1968 program on the property cost approximately $100,000.

The company planned to further investigate other showings on the property. This included the drill testing of another quartz vein, separated from the vein investigated in 1968 by a diabase dyke 50 feet in width. In addition a joint exploration program with PCE Explorations was planned for a group of claims on Achook Island. This group covers a copper showing which is described as looking promising.

Shirex Exploration Ltd. (BEVIS claims)
(86-K-4; about 66° 12'N, 117° 43'W) (Copper)

This property consists of claims BEVIS 3-9, 14-20, 24, 25, 32 and 33 and is located about 12 miles northeast of Port Radium. The property is about 2 miles west of that on which work is being carried out by Mariner Mines.

According to Map 18-1960 (Fraser, 1960) the property should be underlain with quartz-feldspar porphyry of the lower units of the Hornby Bay Group, with the possibility that conglomerate of the Cameron Bay Group could also occur.

A geochemical survey for copper in the B soil horizon was carried out on the property in 1968 and covered 15.1 line miles. The survey was carried out August 17 to September 4 with samples taken each 100 feet along east-west lines spaced 400 feet apart. This work was done by Advance Geology and Geophysics Ltd. and indicated 4 anomalies of 4 to 7 times above a background of about 7 p.p.m. An anomaly about 800 feet long by 200 feet wide on claim BEVIS 16 is associated with a copper occurrence, as is another of the same length, but narrower, on claim BEVIS 20. These two copper occurrences probably lie along shears; the first shows secondary copper mineralization across 30 feet and the second across 25 feet. The other anomalies are on claim BEVIS 8 and in the southwest corner of claim BEVIS 19. An occurrence of malachite without apparent shearing on claim BEVIS 3 in the northwest portion of the property lacks an associated geochemical anomaly.

Drillholes, each of 200-foot length, are recommended to test the two copper anomalies which show related mineralization.

Mogar Mines Ltd. (MOG 1-20 claims)
(86-K-4; about 66° 14'N, 117° 32'30"W)

This property adjoins to the east of that of Mariner Mines. A preliminary investigation of this silver-base metal prospect was carried out in 1968. A program of prospecting and geological mapping was followed by a geophysical survey which outlined three conductors. A magnetometer survey was also planned, but it is not known whether or not it was done. On the basis of the geophysical survey a diamond-drill program was recommended on the property by G.H.D. Consultants (The Northern Miner, Oct. 17, 1968, p. 2).

Rolling Hills Copper Mines Ltd. (HOG 1-36 claims)
(86-K-5; about 66° 18'15"N, 117° 50'W)

This property is on Hogarth Island in Great Bear Lake. Some prospecting was done on the claim group in late 1967 or early in 1968. Electromagnetic surveying was apparently done on the property during the summer of 1968. The property probably covers copper showings.

P. C. E. Explorations Ltd. and Mariner Mines Ltd.
(Achook Island, Great Bear Lake) (Copper)

These companies reportedly acquired a group of claims on Achook Island during the 1968 season. The claims are reported to cover a very promising looking copper showing (The Northern Miner, Sept. 5, 1968, p. 1). Copper mineralization is known to occur across widths of 200 to 300 feet. Initial sampling of the showings suggested a possible grade of 2 to 3% copper. Very little work had been done on the showings, however, and a joint exploration program was planned for late in the 1968 season.

Trans-Canada Oils Ltd. (80%) and Moresby Mines Ltd. (20%)
(RED 1-128 claims) (86-K-5, 6; 66° 27'45"N, 117° 27'W) (Uranium, Copper)

This property is located at and near the mouth of the Sloan River at Hunter Bay on Great Bear Lake. The name of Trans-Canada Oils Ltd. has recently been changed to Trans-Canada Resources Ltd. Minor occurrences of uranium and copper are known to occur on the property in association with a northeast-striking giant quartz vein or quartz stockwork.

The property is underlain by a complex of dacites, granites and porphyries which have been cut by quartz-feldspar porphyry dykes, aplite dykes, two giant quartz veins or quartz stockworks, diabase dykes, and later quartz veins. The two giant quartz veins diverge to the northeast and are considered to occupy two major northeast-trending faults. A third fault crosses about one mile east of the intersection of the giant quartz veins and the resulting wedge-shaped area is reported to be intensely fractured.

Prospecting, trenching, and magnetometer, electromagnetic and scintillometer surveys were carried out during 1968. The exploration crew arrived at the property on June 2. Trenching and a scintillometer survey were in progress when the property was visited on July 14. The scintillometer survey covered only a small part of the property, but indicated a number of radioactive occurrences including several strongly radioactive open fractures which were nearly 200 feet long. Five radioactive occurrences and two copper showings were investigated by trenching.

A grab sample of some of the best material from a radioactive occurrence near the west boundary of claim RED 118 gave an assay of 0.07% U_3O_8. A grab sample of radioactive material from a pit along a radioactive fracture, known as the Harrison Vein, on claim RED 100, assayed 0.03% U_3O_8. A grab sample from a mineralized vein in the quartz stockwork, about 200 feet to the south of the above occurrence and on the same claim, assayed 0.29% Cu.

An old trench in the main quartz stockwork (the "Sloan Dyke") had previously exposed an occurrence of chalcopyrite and bornite. Two samples of the better mineralized material from this pit, on claim RED 37, gave assays of 1.48% and 4.27% Cu. One grab sample from a vertical diabase dyke, about 20 feet wide, on claim RED 99 assayed 1.85% Cu and another assayed 0.26 oz./ton Ag.

A program is recommended for the property which would consist initially of airborne radiometric and electromagnetic surveys, to be followed by work on the ground including trenching and geological mapping to assess the conductors and anomalies. The airborne surveys may have been flown late in the 1968 season.

Westfield Minerals Ltd. (GW claims)
(86-K-5; about 66° 26'40"N, 117° 32'10"W) (Copper, Uranium)

Westfield Minerals Ltd. holds the GW group of claims which adjoins to the southwest of the RED group of Trans-Canada Oils and which contains a mineralized zone occurring within a continuation of the giant quartz vein from the RED group. Diamond drilling on the GW group is reported to have indicated a deposit about 250 feet long which contains approximately 100,000 tons averaging 8.4% Cu (Canadian Mines Handbook 1969-1970, Northern Miner Press Ltd., 1969). Four holes totalling 186 feet were drilled on the property in August, 1950, and further drilling was carried out in 1957. A grab sample from the property reportedly assayed 4% U_3O_8. Further exploration is planned for this property.

International Mine Services Ltd. (PATCH claims)
(86-K-11; about 66° 31'N, 117° 21'W) (Copper)

This property, in the Sloan River area about 10 miles east of McTavish Arm of Great Bear Lake, covers a previously known copper showing consisting of chalcocite and bornite in veins in a stock of granitic rocks. Copper assays for samples from the property are reported to have ranged from 1% Cu to a maximum of 42% Cu across a width of 16 inches.

An electromagnetic survey was conducted on the property in November, 1966, by Sander Geophysics Ltd. It appears that no significant anomalies were detected by this survey.

Anaconda Petroleum Ltd. (LKS 1-155 claims)
(86-K-10; about 66° 39'N, 116° 49'W) (Copper)

This property is located at McLaren Lake about 22 miles northeast of Hunter Bay on Great Bear Lake. Copper showings were discovered here by Dominion Explorers when they prospected the area in 1930. Two channel samples taken at that time assayed 2.74% Cu/35 ft. and 1.62% Cu/65 ft. (The Northern Miner, July 11, 1968, p. 17). A "representative" sample of vein material 3 feet wide from a shoot 525 feet long was reported to have assayed 4.24% Cu. An assay of 17.08% Cu was obtained from a showing with an average width of 1 1/2 feet and an exposed length of 65 feet. A showing of quartz and sulphides more than 8 feet wide was estimated to contain 5% Cu.

The LKS group was staked in the spring of 1968 and was taken under option by Anaconda Petroleum. Under the terms of this agreement the company could acquire an 85 per cent interest in the property on payment of $35,000. Of this amount $10,000 was paid when the agreement was made and the balance was payable within 6 months. The property was visited by the author on August 14, 1968.

A grid was established on part of the property over the breakup period and some magnetometer surveying and prospecting were done. During the season about 100 line miles of semi-detailed magnetometer surveying, with a station interval of 100 feet, were done and 21 line miles of detailed surveying with stations each 50 feet along lines 100 feet apart.

Detailed electromagnetic surveying was done to the extent of 21 line miles by Anglo Celtic Exploration Ltd. Geological mapping of the property was carried out at 1,320 feet to the inch, and some detailed mapping was done at 500 feet to the inch and 125 feet to the inch.

The exploration work resulted in the location of 11 copper showings which were considered to be of some significance. These copper showings are distributed along a length of 3 1/2 miles. In general, the copper showings consist of chalcopyrite as disseminations and fine fracture fillings in giant quartz veins and quartz vein stockworks. Such quartz stockwork "veins" or zones with associated copper mineralization are common within the Bear structural province. At McLaren Lake the quartz stockworks cut, and have apparently replaced to varying degrees, intermediate to acidic volcanics and gneissic igneous rock (possibly granodiorite). The volcanics which are in contact with or form included lenses in the large quartz masses, appear to be quite highly altered. Where the quartz stockwork zone was examined it was up to about 200 feet wide and consisted of bifurcating veins up to at least 50 feet wide. At this point the veins trended somewhat south of east and were arranged in an overall en echelon pattern along the east-west stockwork zone. The copper mineralization is distributed sporadically with the stockwork zone and most mineralized areas were estimated to grade less than 1% copper.

Elsewhere on the property more concentrated mineralization, including some bornite and chalcocite, was reported to occur within definite shear zones.

The showings on the property were extensively trenched, and a total of 150 cubic yards of rock were reportedly excavated. Channel sampling of the showings was not attempted, but instead pieces were selected from the width being sampled which were judged to be representative. Of ninety-three assay results from the season's work, only 15 were 1% copper or better. These assay results, in per cent copper, were 1.65, 2.50, 3.90, 6.15, 2.00, 7.70, 2.15, 4.10, 1.35, 1.10, 1.00, 4.75, 4.55, 2.10 and 1.65. The most significant of the assay result were 4.55% Cu/2 ft., 4.75% Cu/2 ft., 7.70% Cu/2 ft., 3.90% Cu/2 ft. and 2.50% Cu/4 ft. A few of the samples assayed as much as 0.22 oz./ton Ag.

It was announced (The Northern Miner, Sept. 19, 1968, p. 7) that the company planned to drill one of the copper showings. However, it appears that this drilling was not done.

COPPERMINE RIVER-CONTWOYTO LAKE-CORONATION GULF AREA

Coppermine Area (86 M, N, O)

Although exploration in the Coppermine River area during the years 1966 through 1968 is described in a separate report (Thorpe, 1970) an outline of the activity will be presented here.

Extensive staking in the Coppermine River area was undertaken by PCE Explorations in late 1966 following a season of reconnaissance investigation of copper showings in the area. The first staking covered the main known and newly located showings, and then spread out to cover a large part of the basalts of the Coppermine River Group lying between the Teshierpi and Herb-Dixon Faults. This staking sparked a major rush to the area.

Staking in the Coppermine River area was generally restricted to the basalt sequence of the Coppermine River Group, although the immediately overlying sediments were covered to some extent. The staking was done within three 4-mile topographic sheets (86 M, N and O) and extended along the basalt belt for 135 miles with widths from roughly 14 to 35 miles. However, exploration was concentrated along a length of 100 miles and little attention was devoted to claims at the western end of the belt, except for some groups on claim sheet 86-M-9. This neglect of the west end of the outcrop area of the basalts was apparently due to the much poorer exposure in relation to the remainder of the belt and to the weakly mineralized nature of the copper occurrences that were found by reconnaissance. In excess of 45,000 claims were staked in the area from early 1966 through 1968, and more than 100 companies held properties or a substantial interest in properties.

Coppermine River Ltd., which company was formed for the exploration of the large number of claims staked by PCE Explorations, carried out an extensive exploration program in 1967. Other companies conducted smaller programs, many of them of a preliminary nature. The summer of 1968 was the season of most concerted exploration in the area. A number of the exploration programs that season were of enormous size, with exploration budgets of the order of $500,000 or more, and were conducted by consortiums of companies. Exploration on this scale was prompted by the drilling success of Coppermine River Ltd. on the No. 47 zone in 1967.

An electromagnetic-magnetic airborne survey was organized on a joint basis, with more than 50 companies participating, for early in the 1968 season. The survey was contracted with Huntec Ltd. and Lockwood Survey Corporation. The ground exploration procedures had become quite standardized by early in the summer of 1968. Radio-frequency electromagnetic surveys and magnetometer surveys were being used over entire claim groups or in areas of favourable fault structure. Zones that were magnetically low were generally considered to be zones of hematitization (destruction of magnetite) along faults and were considered favourable. When a good electromagnetic conductor was found in association with a magnetic low, the zone was generally considered to warrant testing with an induced polarization survey. This method was the most highly regarded, but was used less extensively due to its much greater cost. Induced polarization surveys were done over wider areas in a few cases, where the areas were judged to have potential on other than geophysical evidence.

However, it must be noted that neither induced polarization surveys nor a combination of geophysical methods provided an infallible procedure for detecting economic mineralization. Drilling of many good induced polarization anomalies indicated the presence of barren fault or shear zones, with the basalt in many cases altered by chloritization and/or hematitization. Some of the drilling on such anomalies indicated the presence of minor copper mineralization or pyrite.

Following the 1968 season it was reported by Coppermine River Ltd. that drilling had indicated that the No. 47 deposit contained 3,571,000 tons averaging 3.44% Cu, or 4,106,000 tons averaging 3.07% Cu after allowing for 15% dilution by wall-rock containing 0.6% Cu.

Contwoyto Lake - Coronation Gulf Area

Gossan zones in Yellowknife Group rocks were investigated in three Premit Areas between Contwoyto Lake and the Hood River by Borealis Exploration in 1968. In 1967 some vein deposits were investigated in similar rocks some distance to the north on the James River and several groups of claims were staked. In 1966 work was continued by Consolidated Manitoba Mines on a gold property near Coronation Gulf and a short distance east of the Tree River.

Trans-Canada Oils Ltd. (80%) and Moresby Mines (20%)
(Belleau Lake property) (86-J-5; about 66° 17'N, 115° 50'W) (Uranium)

This property consists of 43 claims which were staked in 1967. Surface work with a geiger counter and assays on random grab samples reportedly indicated an interesting zone of radioactivity on the property. An airborne radiometric survey was flown over the property late in the 1968 season. The results of this survey are not known. The name Trans-Canada Oils Ltd. has recently been changed to Trans-Canada Resources Ltd.

Muskox Intrusion (86-J-7, 14)

Two properties (OXO and TOC groups) were staked in 1967 near McGregor Lake (about 66° 53'N, 115° 15'W) and another (OX group) near Peanut Lake (about 66° 16'N, 114° 46'W), roughly 50 miles to the south, by Trans-Canada Oils Ltd. (now Trans-Canada Resources Ltd.) (80%) and Moresby Mines (20%). A crew was reported to be working on these properties late in the 1968 season (The Northern Miner, Sept. 19, 1968, p. 8). Airborne and ground geophysical surveys were planned for these properties.

F. Koosel (A 1-30 and B 1-6 claims)
(76-M-2; about 67° 08'N, 110° 55'W) (Silver, Lead, Zinc, Antimony, Gold)

Mr. Koosel and his prospecting partner spent a large part of the 1967 season examining the veins in the vicinity of James River that he had encountered while working in the area some years previously for Kennco Explorations or Pan-American Ventures. This prospecting was assisted by the Federal Government through the Prospectors Assistance Program. These veins were extended and new ones turned up by the prospecting and the A and B claim groups were recorded.

The main veins are located on the A group of claims. The veins contain pyrrhotite, sphalerite, galena, boulangerite, arsenopyrite and minor chalcopyrite. The boulangerite occurs as massive felted seams and irregular masses and is an abundant constituent of the veins. The veins are narrow, seldom more than 1 foot wide, but a series of them have been traced discontinuously for a length of nearly a mile. Silver is the element of chief interest and assays of the order of 50 oz./ton are reported for the vein material.

The property is underlain predominantly by metamorphosed sediments of the Yellowknife Group. The metasediments include argillite, impure

quartzite, and schists, and are reported to strike about N40° E and to dip steeply to the southeast. Some flows of rhyolite and pillow lava, and bands of amphibolite, are apparently interlayered with the sediments. These rocks are cut by a number of northwest to west-northwest striking diabase dykes.

Veins on claim A 5 apparently occupy shear or fracture zones. The veins contain arsenopyrite, pyrrhotite and boulangerite. The best sample from a trench near the north boundary of the claim assayed 0.5% Pb, 1.0 oz./ton Ag, 2.0 oz./ton Au and 8.56% Sb. The veins are apparently exposed intermittently for about 3/4 mile in the direction S20° W to the north part of claim A 10.

A similar showing of galena, sphalerite and boulangerite in north-northeast striking fractures or shears is exposed near the northeast corner of claim A 14. This showing is located about one mile northeast of that on claim A 5. The mineralized zone is about 20 feet wide and apparently at least 200 feet long. A sample of massive galena and sphalerite from the showing assayed 0.03% Cu, 5% Sb, 13.27% Zn, 71.44 oz./ton Ag and 51.38% Pb. The veins on this claim are reported to be in both slate and rhyolite.

The B group of claims lies immediately west of the north part of the A group. Arsenopyrite-bearing quartz veins near the southeast corner of claim B 1, and also about 500 feet northwest of this, were investigated by trenching. The contact between the host metasediments and a granite intrusion to the west lies approximately 600 to 1,000 feet from the showings. The best assay result from the showing was 3.1 oz./ton Au. These gold-bearing veins are reported to be 10 inches to 2 feet wide and to contain some boulangerite and pyrrhotite.

A total of about 200 soil samples were taken for geochemical analysis from along the mineralized zones on the property, and possibly in the vicinity of gossan zones with no known significant mineralization as well. The results of analysis of these samples are unknown.

F. Koosel (C 1-11 claims)
(76-M-3; about 67° 10'40"N, 111° 02'25"W) (Silver, Copper, Zinc)

This claim group is located about 4 miles northwest of the B group in the same area. These claims were also staked while the area was being prospected in 1967. A number of gossans, apparently related to sulphide-bearing shear zones, are present on claims C2, 3 and 7.

Pyrrhotite, pyrite, sphalerite and a little chalcopyrite form a showing in a rhyolite breccia near the east boundary of claim C9. The best showing is in a northeast-striking zone of shearing in siliceous rock, probably rhyolite, on claim C5. This showing is near the contact with red hornblende granite to the west. Pyrrhotite, pyrite, chalcopyrite, sphalerite and minor galena are present in the shear together with hornblende schist and quartz veinlets. A sample from the showing assayed 1.0% Zn, 1.78% Cu and 2.0 oz./ton Ag.

Borealis Exploration Ltd. (Permit Areas 76-L-4, 10 and 15)

Permit Area 76-L-4 lies just northwest of Contwoyto Lake and Permit Areas 76-L-10 and 15 are located northeast of this on the Hood River.

The latter permit areas cover the south part of a greenstone-amphibolite belt which trends north-south (Fraser, 1964) and contains, about 28 miles farther north, the zinc-copper deposit of Kennco Explorations at "High Lake". Permit area 76-L-4 covers part of an apparently isolated area of similar greenstone and amphibolite. These rocks are considered to belong to the Yellowknife Group of Archean age (Fraser, 1964).

These permit areas were acquired prior to the 1968 exploration season. Borealis Exploration is backed by Catawba International, Inc., of New York. Exploration was done on the permit areas in 1968, this consisted primarily of investigating and sampling a great number of gossans. Work was apparently concentrated in the areas 76-L-4 and 76-L-15, and gossans in the latter area apparently are the largest and have the greatest continuity.

Mr. J. Woolgar (Tree River Area)
(86-P-1, 8) (Copper)

Mr. Woolgar staked the EVE 1-72 claims (86-P-1) and the RAY 13-24 claims (86-P-8) during the 1966 season in the area between Takiyuak Lake and the mouth of the Tree River. The EVE group is located at about 67° 12'N and 112° 20'W, and is a restaking of a group by the same name which was staked by Mr. Woolgar in 1954. The RAY group is located at about 67° 17'N and 112° 16'W, and is a restaking of the ADAM group which, likewise, had been staked in 1954.

On the EVE group pyrite and chalcopyrite are disseminated in fractures in a quartz stockwork about 3,000 feet long and 100 feet wide. This stockwork occupies a northeast-striking fault cutting dolomite and limy shale of the Epworth Group. The sulphide content has been reported to be highest near late northwest-striking gabbro dykes. Most grab samples from the property assayed less than 1% Cu.

On the RAY group pyrite, chalcopyrite and hematite are disseminated along fractures and veinlets in carbonate zones in a giant quartz vein about 2,000 feet long and up to 50 feet wide. The vein strikes somewhat north of west and cuts faintly gneissic granitic rocks which include patches of dolomite of the Epworth Group. The carbonate zones in the giant quartz vein are up to 100 feet long and 20 feet wide and may represent altered dolomite inclusions or introduced carbonate. Grab samples from the showing are reported to have assayed up to 4.5% Cu.

This property was apparently optioned by Torwest Resources Ltd. prior to the 1968 season. A magnetometer survey was reported to have been conducted on the property.

Consolidated Manitoba Mines Ltd. (H 1-50 claims)
(76-M-11; about 67° 42'N, 111° 21'W) (Gold)

This property is near Coronation Gulf and is about 6 miles east of the Tree River. Exploration was carried out on a number of properties in the area in 1964 and 1965 and has been summarized by Schiller (1965) and Thorpe (1966). An exploration program by Precambrian Mining Services on the H claims was the only work done in the area in 1966. The property was visited by the author on July 13, 1966.

The No. 3 vein on the southern part of the H group was the main target of investigation in this program. The vein strikes northeast and is fairly typical of the veins of the area. At the northeast end of the vein the first trench to show mineralization gave very good gold values over a width of one foot or less. For 100 feet to the southwest good gold values were obtained and visible gold was evident in a number of trenches. The vein along this section dips as low as 45° to the southeast. Some hematite is present on fracture surfaces in the quartz.

As the vein is followed down a relatively steep slope to the southwest the quartz is very white and barren-looking, although some sections reportedly gave good values. The gold values generally appear to be associated with thin seams of pyrite. It is evident along this part of the vein that, although locally the dip is only moderate, the overall dip is quite steep. Toward the bottom of the hill the vein is higher in pyrite content and is up to 5 feet in width. Farther southwest the vein contains chalcopyrite in addition to pyrite and varies from 2 to 4 feet in width. Much trenching and sampling was done on the vein during the 1966 season.

At the time the property was visited by the author on July 13 a section of the vein southwest of the part described above was being drilled. A number of specimens with visible gold were obtained from the surface outcrop of the vein at this section. The total drilling program for the season consisted of 3,779 feet in 26 holes but was somewhat disappointing in that it failed to substantiate surface indications. However, seven holes over a length of 186 feet indicated an average grade of 0.45 oz./ton Au across a width of 4.1 feet. A program of structural mapping was recommended for the 1967 season, but was apparently not implemented.

While exploration was concentrated on the original H group, some prospecting and trenching was done on an 18-claim group located to the south and a 30-claim group located to the east. No significant results were obtained on either of the new groups.

It seems likely that, except possibly for minor work to keep the claims covering the best veins in good standing, the low grade deposits of this area will not receive further attention for many years.

BATHURST INLET AREA

Claims were staked on the known copper showings in the lavas of the Coppermine River Group in the Bathurst Inlet area in early 1967. These claims were acquired by the associated companies Arlington Silver Mines, Flagstone Mines, and Largo Mines and a preliminary exploration program was conducted during the summer of 1967. The properties were further investigated late in the 1968 season by reconnaissance geological mapping, and geophysical and geochemical surveys.

In 1966 some additional diamond drilling was done by Roberts Mining Company on a gold property on the Hood River. A gold property of the Contwoyto Lake-type, located east of the south part of Bathurst Inlet, was investigated by Trans-Canada Oils and Moresby Mines. Some drilling was done on the galena veins at Galena Point and a small shipment of galena was made.

Claims were staked by Bathurst Inlet Mining Corp. and Norsemines Exploration on gossan zones near Hackett River. Some of these zones were

known to be due to massive sulphide mineralization in highly metamorphosed sediments of the Yellowknife Group, but their potential had not been seriously investigated. Preliminary mapping and geophysical surveying were done on some of the claim groups in 1968.

Bathurst Inlet Mining Corp. Ltd.
(BB 8-25, 51-68, 80-97, BAT 1-18, HURST 19-23)
(76-F-16; about 65° 55'N, 108° 22'W) (Zinc, Silver, Lead)

This property is near Hackett River and about 45 miles southwest of the south tip of Bathurst Inlet. The 87-claim property was staked to cover a large gossan which was located during helicopter mapping in the area (Fraser, 1964). The gossan zone is up to 400 feet wide and 3,000 feet long and some chalcopyrite and gold values were known to occur along the zone. TC Explorations holds a 12 per cent interest in Bathurst Inlet Mining and provides the management.

Geological mapping at 1,000 feet to the inch was carried out on the property June 15 to July 12, 1968, by Precambrian Mining Services. Outcrop occupies about 30 per cent of the area of the property. Dark quartzite showing variable schistosity, quartz-muscovite schist, quartz-biotite schist and biotite amphibole-garnet schists are the principal rocks underlying the property. The schistosity strikes about N30° W and dips steeply. Pyrite-rich dark slaty quartzite appears to be responsible for many of the gossan zones. A sericitic quartzite is only present around the main sulphide showing. Many granitic and pegmatitic dykes cut the metasedimentary rocks.

The main sulphide zone contains pyrite, pyrrhotite, arsenopyrite and chalcopyrite. An electromagnetic survey of the area, completed prior to mapping, indicated four conductor areas.

The main conductor trends east and then swings sharply to the south, and coincides with the main showing. This showing may be related to drag folding and associated shearing of a sulphide-rich sedimentary horizon. The sulphides are in a sericitic quartzite which appears to be leached. Other conductors are related to bands and disseminations of pyrite and pyrrhotite in the quartzite country rock.

A limited program of diamond drilling was recommended to test the main conductor-gossan zone. Further claims were staked in 1968, apparently jointly with Norsemines Explorations, and additional claims were acquired by the latter company.

Norsemines Exploration Ltd. (OX 1-98, DL and RN claims)
(76-F-15, 16)

These claims form part of a total of at least 400 claims held by the company in the Hackett River area. The DL and RN groups total 72 claims. The claims, at least in part, adjoin the property of Bathurst Inlet Mining Corp. Ltd. on which a diamond-drilling program was planned for the 1969 season to test an extensive gossan zone. Other gossan zones are known to occur on the Norsemines property.

Mr. Gordon Leonard, consulting geologist for the company, visited the claim groups in August 1968 (News of the North, Yellowknife, Aug. 29, 1968). Exploration on the property was planned for the 1969 season.

Roberts Mining Company Ltd. (NOEL claims)
(76-N-2; about 67° 03'N, 108° 47'W) (Gold)

This property is located near the Hood River and about 7 miles west of Portage Bay on Bathurst Inlet. A gold showing was discovered here by Noel Avadluk during the winter of 1963-1964. The property has been described by Schiller (1965) and Thorpe (1966). Some drilling was done on the F zone on the property in 1965. Hole PL-1, which formed part of this program, gave three intersections which assayed 0.20 oz./ton Au from 70 to 75 feet, 1.77 oz. from 75 to 80 feet and 1.05 oz. from 115 to 120 feet.

Twelve trenches were excavated on the F zone in 1965 and 10 more trenches in 1966. The best results from sampling these trenches were assays of 0.54 oz./ton Au across 5 feet in trench No. 12 and 0.50 oz./ton across 1 foot in trench No. 15.

In 1966 additional drilling was done July 20 to August 13 on the F zone gold showing, located on claim NOEL 33. The 8 holes drilled in the two years to test this zone totalled 2,257 feet. The results of this drilling were as listed in the table below. The baseline runs due north from an origin about 440 feet south of a small lake located at about 67° 03'N and 108° 47'30"W, about 1 1/2 miles west and slightly south of a bend in the Hood River.

Hole No.	Latitude	Departure	Bearing	Inclination	Depth (ft.)	Intersection	Au (oz./ton)
PL-4	1+12N	0+00	-	90°	337	265'-270'	0.42
PL-5	0+80N	1+80E	NE	70°	206.5	110'-112'	0.16
						171 1/2'-176 1/2'	0.80
PL-6	1+00N	4+00E	NE	40°	265		
PL-7	1+60N	2+69E	-	90°	206	44'-48 1/2'	0.25
						102'-106'	0.14
						136'-140'	0.16
PL-8	0+39S	4+37E	N51 1/2E	40°	270		

The gold showing is in quartz-biotite gneiss and other highly metamorphosed sedimentary rocks of the Yellowknife Group (Fraser, 1964). Some of the rocks contain garnet and abundant amphiboles. Pyrite, pyrrhotite and arsenopyrite are relatively abundant in amphibolite interbeds which range up to about 5 feet in thickness. These minerals form up to an estimated 30 per cent of some of the amphibole-bearing bands. The assay results listed above generally represent some of the most sulphide-rich intersections. The general features of the gold mineralization appear to be similar to those of the Contwoyto Lake gold deposits (Baragar and Hornbrook, 1963, pp. 13-22; Schiller and Hornbrook, 1964a, pp. 10-16; Schiller and Hornbrook, 1964b; Schiller, 1965, pp. 12-14; Bostock, 1967; Bostock, 1968; and Tremblay, 1967).

The "Farney Lake" showing is south of the F zone. This showing was investigated by 16 trenches or shallow pits across a width of about 200 feet. The best results from sampling these trenches are shown on page 101.

This group of claims, together with a number of other groups in the Bathurst Inlet-Elu Inlet area, was optioned by the Hope Bay Syndicate from Roberts Mining Company prior to the 1967 season. The "Farney Lake" zone was considered to possibly have more potential than the F zone.

Trench	Width(ft.)	Au(oz./ton)
1	1	2.35
4	3	0.54
5	2	0.80
7	0.5	1.12
9	2	0.65
10	1.5	0.46
11	1.5	1.86
12	3	4.74
13	2	0.52
15	3	0.34

However, strike continuity of the gold-bearing zones was not certain and, in spite of a few sporadic high gold assays, the overall grade and width were considered to be too low for the remote location. Accordingly, no further work was done on the property in 1967 and it was allowed to revert to Roberts Mining prior to the 1968 season.

Arlington Silver Mines Ltd. (BOB 1-100 claims)
(76-O-5; about 67° 25'N, 107° 53'30"W) (Copper)

This property is located on Kanuyak Island adjacent to a group of claims staked by PCE Explorations when they did some reconnaissance exploration in the area in 1966. The BOB claims were staked in May and September 1967. A preliminary investigation of the BOB group was carried out in 1967. The group of claims lies along the contact between dolomite and overlying basalts. Some disseminated chalcocite is known to occur in the dolomite within several feet of the contact.

Geological mapping, an electromagnetic survey, and a geochemical survey were carried out on the property by William P. McGill and Associates Ltd. in August and September 1968. Dolomite and limestone, with minor interbeds of sandstone and shale, of the Parry Bay Formation are overlain by sediments and basalt flows of the Coppermine River Group. The Parry Bay Formation is overlain by thin lenses of red quartzite and shale, considered to represent a break in sedimentation, and these are overlain by basalt flows. In a few places conglomerate immediately overlies the sediments of the Parry Bay Formation. In places the Parry Bay Formation is directly overlain by basalt. Approximately 80 per cent of the property is underlain by basalts. Two faults were recognized on the property and these have northwest strikes.

The main chalcocite-bearing zone is on claim T 14954 and consists of concentrated mineralization in a band approximately 6 inches thick. A chip sample was taken representing a combined length of 80 feet in two sections, with covered areas between, within a distance of 1,300 feet. This sample assayed 13.4% Cu. This mineralization is apparently in dolomite along or very near the contact with overlying basalt. The contact strikes about north-south and dips 3° to 18° west; the copper mineralization may thus be of great lateral extent.

The radio-frequency electromagnetic survey covered approximately 16.7 line miles. The survey was done on a series of east-west lines that were 1,000 feet long and 250 feet apart. Only two anomalies were detected and these were attributed to the influence of the salt water of the nearby seashore.

The scanty distribution of soil limited the geochemical soil survey to scattered and irregular areas of low ground. The samples were analyzed colorimetrically in the field for total heavy metals, but little significance was attached to the results.

In addition to the main zone of mineralization, some chalcocite and native copper are present in amygdules and fractures in the basalts.

Further investigation of the main mineralized zone was recommended by driving short adits or by cutting benches along the edge of the mineralized zone and its extensions. This approach has been recommended because the zone is exposed on a nearly vertical cliff.

B. I. Nesbitt (ED 11-72 claims)
(76-N-7; about 67° 18'30"N, 108° 40'W) (Copper)

This 62-claim property in the Bathurst Inlet area is located on Banks Peninsula approximately 30 miles southwest of Baychimo. A reconnaissance investigation of the property was made in August 1968, by William P. McGill and Associates Ltd. A photogeological study of the property was done prior to the field work using photographs at about 1 mile to the inch.

Basalt exposed on the west part of the property is overlain by a sill of diabase or diorite. The preliminary geological investigation failed to indicate any faults or copper mineralization. A radio-frequency electromagnetic survey was carried out along east-west lines spaced 500 feet apart. Readings were taken each 100 feet. Sixty-three soil samples were taken in small scattered areas. The samples were analyzed colorimetrically in the field for total heavy metals, but little significance was attached to the results.

The electromagnetic survey consisted of 54.3 line miles and covered the entire property and resulted in a large number of anomalies. Six anomalies were dismissed as probably due to water, and 15 others were considered to be too weak for further consideration. Anomaly N is about 6,000 feet long and was considered to reflect a minor fault zone. The south half of the anomaly is fairly strong and may be mineralized. The north-south zone lies on claims T14862 to T14864, with the strongest part of the anomaly located on the central claim. Testing of this conductor by 2 or 3 drillholes totalling 1,000 feet was recommended.

Anomaly Z is sharp and moderately strong and is located near the site of a soil sample that was high in total heavy metals. The anomaly is not, however, rated very highly. Anomaly Q is considered to warrant further attention only if mineralization is found in association with anomaly Z. Anomaly K is moderately strong and reassessment is recommended after further work is done in the vicinity.

B. I. Nesbitt (CAMP 1-6 claims)
(76-O-12; about 67° 38'45"N, 107° 57'30"W) (Copper)

This 6-claim group is located on Ekalulia Island opposite the JOE group of Flagstone Mines, which is located on the east shore of Bathurst Inlet. This property, and many others on known and newly discovered copper occurrences in the basalts of the Coppermine River Group within Bathurst Inlet, were staked by the Flagstone Mines-Arlington Silver Mines-Largo Mines

interests in 1967. Preliminary exploration in the area, consisting mostly of prospecting and trenching, was carried out during the 1967 season under the supervision of Dr. H. Quinn.

In 1968 the various properties held by Mr. Nesbitt and the companies noted above were investigated by William P. McGill and Associates Ltd. between August 9 and October 24, 1968. Reconnaissance geological mapping and radio-frequency electromagnetic and geochemical surveys were conducted.

The property is largely underlain by a diabase sill of considerable thickness which dips 5° -10° SW and overlies basalt and dolomite. Two parallel faults about 2,000 feet apart strike northwest across the property.

The signal broadcast from Seattle, Washington, was used for the electromagnetic survey. Two anomalies were detected in the survey, but the southern anomaly is broad, of moderate strength only, and is considered unimportant. The northern anomaly trends easterly on claims T9021 and T9022 and appears to lie near and parallel a fault. This anomaly is strong and has been considered to warrant further investigation.

More detailed electromagnetic surveying has been recommended for the main anomaly. Testing of this zone by diamond drilling has also been recommended.

Arlington Silver Mines Ltd. (DOUG 1-36 claims)
(76-N-9; about 67° 34'N, 108° 27'W) (Copper)

This claim group is located on the northwest tip of Algak Island. The property was staked early in 1966 to cover a beach area reputed to be an important source of the native copper used by the Eskimos many years ago, and to cover several basalt flows reported by the Canadian Arctic Expedition (O'Neill, 1924) to contain native copper both in amygdules and in fractures and seams. Preliminary investigation of the property was carried out in 1967.

A program of geological mapping, geochemical and geophysical surveys was conducted on the property by William P. McGill and Associates Ltd. in August and September 1968. A photogeological study of the property was done prior to the field work.

The property is entirely underlain by basalt flows which are generally massive and dip gently to the west and northwest. Minor copper mineralization is present in amygdules. Calcite, zeolites, quartz, chalcedony, epidote, hematite and chlorite are present along joints and in amygdules. Two northwest-striking faults cross the property and two other faults, one northeast-striking and the other northerly striking, have been inferred.

At two places native copper occurs along joints as well as in amygdules. In one area native copper is conspicuous as thin sheets, nuggets and thick slabs. This group of occurrences lies in an area of shattered rock rubble that mantles a broad fault zone that crosses the boundary between claims T8899 and T8900. The largest slab of native copper that was discovered was estimated to weigh about 170 pounds.

A total of 61 soil samples were taken from the southeast part of the property and were analyzed colorimetrically for total heavy metals and gave values up to 100 p.p.m. Some high values were obtained from the south-central part of the property.

A radio-frequency electromagnetic survey was carried out along north-south lines spaced 500 feet apart. Anomaly 1 is a strong conductor

which coincides with a major fault zone, although the best response was obtained at the end of a small pond and may be due to wet overburden. Anomaly 2 is of moderate strength and coincides with a zone of fairly high total heavy metals, and may reflect disseminated sulphides. Anomalies 3 and 4 appear to lie along the same major fault. Slabs of native copper were found in the rock rubble that covers the northward extension of this fault. Anomaly 5 is a generally weak anomaly which has considerable length, but no known associated mineralization. Although also lacking associated mineralization, anomaly 6 is moderately strong and further exploration has been suggested. Anomaly 7 may be along a fault and is moderately strong and persists for 2,000 feet. Anomaly 8 consists of one very strong crossover, possibly related to anomaly 5.

The drilling of three holes was recommended to test anomalies 1, 3 and 8.

Flagstone Mines Ltd. (PETE 1-36 claims)
(76-N-9; about 67° 38'N, 108° 26'30"W) (Copper)

This claim group is on Iglorua Island in Bathurst Inlet. A preliminary investigation of the property was done in 1967. Trenching was done to better expose showings consisting of sheets of native copper in fractured and brecciated zones associated with strong faulting in the basalts. Two strong fault zones were mapped on the property.

Geological mapping and electromagnetic surveying were done on the property in August 1968, by William P. McGill and Associates Ltd. A photogeologic study was done prior to the field work.

The property is entirely underlain by basalts of the Coppermine River Group. The basalts are grey, brown, red, greenish grey, and purple in colour, are fine grained, and are generally columnar and blocky. Amygdaloidal layers are present but are much more poorly exposed than the massive flows. On one part of the property a section 15 feet thick within a massive flow of fine-grained brownish grey basalt is stained with copper.

The radio-frequency electromagnetic survey totalled 27.1 line miles and was conducted on north-south lines spaced at 500-foot intervals. The survey indicated a northeast-striking fault on the west part of the property which is terminated by another fault striking northwest. Both faults are conductive and are considered to be promising sites in which to locate copper deposits.

Nine anomalies, other than those along the above faults, were located by the survey. Anomalies 5, 7 and 10 consist of single crossovers. Anomaly 3 is closely associated with a fault inferred from the electromagnetic results. The cause of anomaly 6 is not known, but together with anomalies 4 and 3 could represent a discontinuous easterly striking zone of faulting. The four strongest anomalies, in their order of assigned merit are No. 2, No. 11, No. 8 and No. 7, although the latter represents a single response. Anomaly 2 is considered to be of greatest interest where it meets or crosses the inferred northwest-striking fault.

A total of 2,000 feet of diamond drilling has been recommended to test the four strongest electromagnetic anomalies.

Flagstone Mines Ltd. (JOE 1-36 claims)
(76-O-12; about 67° 39'N, 107° 49'30"W) (Copper)

This group of claims is located on the mainland on the east shore of Bathurst Inlet. Some preliminary investigation of the property was accomplished during the 1967 season.

The mineralization consists of chalcopyrite and pyrite which occur as disseminations and fracture fillings in granitic rocks. The sulphides are apparently related to a fault which trends about east-west and are distributed along 1,500 feet. Massive veinlets of chalcopyrite and pyrite are up to 4 inches wide. A selected sample from a trench on the property is reported to have assayed 5.54% Cu and 1.6 oz./ton Ag.

Geological mapping and an electromagnetic survey was done on the property by William P. McGill and Associates Ltd. in September 1968. A photogeological study was done in August before the crew was moved to the property.

Granodiorite occupies most of the north part of the property. The granodiorite has been cut by faults and diabase dykes which strike north-northwest, and by one northeast-striking diabase dyke. A body of grey granite in the central part of the property is in contact with a small body of amphibolite to the east and the amphibolite is succeeded by pink granite. The south edge of the grey granite is marked by an east-west fault, and faulting and copper mineralization extend east into the pink granite. This faulted section is also the locale of a mass of hematitic paragneiss. Aplite and pegmatite have intruded the more massive granitic rocks.

Gneissic pink granite and syenite are present on the remainder of the property to the south of the faulted section. The south part of the property is quite highly faulted and the granite and syenite are at least partly in fault contact. The metamorphic grade and degree of migmatization are considered to decrease away from the shoreline. The rocks are cut by north-trending diabase dykes and by a few which strike east-northeast and north-northwest.

Gossans present on the north part of the property are due to pyrite and/or biotite. The best exposed copper mineralization is at the edge of the ocean where the rock is a very reddish mixture of syenite, granite, pegmatite and a few narrow quartz veins. Chalcopyrite and pyrite are present in all of the rocks, in part disseminated in reddish syenite. Chalcopyrite occurs in places for a length of 1,000 feet along an east-striking fault. The main area of copper mineralization is on claim T8825.

The radio-frequency electromagnetic survey resulted in 14 anomalies. Anomalies 10 to 14 were the strongest and may possibly represent a single north-striking conductor that has been offset by the east-striking mineralized fault zone. Alternatively, Anomaly 14 may represent a conductive zone along the latter fault. Anomaly 14 is located near the northeast corner of claim T8829. Anomaly 13 is strong and of moderate length, but may represent a response from the shore of a lake. Anomalies 7 and 8 are parallel conductors of moderate strength and either may be an extension of Anomaly 10.

A drilling program to test Anomaly 14 was recommended by the company geologist.

Largo Mines Ltd. (CHAR 1-30 claims)
(76-N-9; about 67° 33'N, 108° 03'W) (Copper)

This property is located on Ekalulia Island in Bathurst Inlet and was staked to cover raised beaches in which vein material rich in native copper has been found. The claims were recorded in May 1967. The property was examined in a preliminary manner during the summer of 1967. The native copper occurs in a gangue of quartz, carbonates and zeolites. The vein material is plentiful in the raised beaches and is thought to be from an underlying fault zone. A sample of many chips of the vein material assayed 2.76% Cu and 0.2 oz./ton Ag.

William P. McGill and Associates Ltd. were responsible for geological mapping and an electromagnetic survey on the property in September 1968. A photogeological study of the property was done prior to the field program.

The property is generally underlain by basalt flows of the Coppermine River Group (Fraser, 1964). Crossbedded acidic agglomerate has been reported to overlie the basalt flows in the very southwest corner of the property. The volcanic rocks dip approximately 4° west. Three fault zones were inferred to be present in the northwest quarter of the group. One copper occurrence was located which consists of native copper in amygdules and as particles disseminated in massive basalt.

The radio-frequency electromagnetic survey covered the entire property and was conducted along northwest-southeast lines spaced 500 feet apart. Only two anomalies of appreciable strength were detected. Anomaly H is on claim CHAR 26, the most northwest claim of the group, and is near an assumed zone of faulting. The anomaly is strong although it was only detected on one line. It should be noted that the orientation of the survey lines was considered to be poor, since they paralleled the basalt outcrop ridges and several of the inferred faults. Anomaly J is of moderate strength but may be related to a small pond. None of the anomalous zones on the adjoining TINA group extended onto the property.

Testing of Anomaly H by about 1,000 feet of diamond drilling was recommended.

Largo Mines Ltd. (TINA 1-72 claims)
(76-N-9, 76-O-12; about 67° 33'30"N, 108° 01'30"W) (Copper)

This group of claims is on the central part of Ekalulia Island and, as with most of the groups held by Largo and affiliated companies, was recorded in May 1967. The group lies to the north of the CHAR claims which are held by the same company.

An exploration program consisting of geological mapping and electromagnetic and geochemical surveys was carried out by William P. McGill and Associates Ltd. in August 1968.

Although exposure on the property is poor it appears to be almost entirely underlain by basalt flows of the Coppermine River Group. The basalts range in colour from purple to brown, green and dark grey. Vesicles are filled with chlorite, agate, quartz, zeolites and calcite. The flows dip approximately 5° west and are overlain by a thin bed of agglomerate near the northwest boundary of the group. The agglomerate is in turn overlain by a thick diabase sill. Diabase dykes which cut the basalts are exposed in the

southeast and northeast parts of the property, the dyke at the latter locality strikes northerly. A broad fault zone is inferred to strike northwest through the southern part of the group.

One showing on the property consists of chalcopyrite, epidote and specularite in a silicified breccia in basalt. The showing may be related to a nearby diabase sill, but is not considered to be significant in itself. At a second locality chalcocite veinlets are present for a length of about 200 feet in close association with a diabase dyke which has been introduced into a fracture zone.

A slab of native copper weighing about 10 pounds and up to 1/2 inch thick was found in overburden near the northern boundary of a broad northwest-striking fault zone. A fourth showing consists of native copper, zeolites and calcite in amygdules in basalt rubble derived from underlying basalt. Minor native silver was noted in close association with the native copper.

A total of 30 soil samples were taken from suitable areas in the extreme northeast corner and near the south boundary of the property. The samples were analyzed colorimetrically in the field for total heavy metals. The results are not considered to be significant, except where they support geophysical anomalies.

Readings for the radio-frequency electromagnetic survey were taken each 100 feet along northwest-southeast lines spaced 500 feet apart. Anomaly P is located on claim T8950 and extends north onto claim T8949. This anomaly is considered to be significant because its peak coincides with an inferred fault. Anomaly B is moderately strong and is near a diabase dyke. An anomalous soil sample coincides with the north end of the anomaly.

Anomaly A is also coincident with a geochemical anomaly, but was only detected on one survey line. Anomaly Z is of moderate strength and is just west of the claim group. Anomalies G, S and Y are moderately strong single crossovers that are not near any known structures. Both G and Y may be caused by water. Anomaly R is near salt water, but is strongest away from the shore and could be significant.

It has been recommended by the consulting firm that further work on the property should take the form of a drill program to test the B and P electromagnetic anomalies.

Flagstone Mines Ltd. (POLAR 1-100 claims)
(76-N-10; about 67° 34'N, 108° 34'30"W) (Copper)

This property is on the east side of Wollaston Point and was staked to cover basalt flows which show copper staining in cliff faces along the point. The claims were recorded in March 1967.

Geological mapping and electromagnetic and geochemical surveys were done on the property in August 1968, by William P. McGill and Associates Ltd. The reconnaissance geological mapping was done by traversing along east-west lines spaced 500 feet apart that had been established for the geophysical and geochemical surveys. The property is underlain by basalt and four main flows were recognized. A flow of greenish grey massive basalt is partly covered by talus and extends to below sea level. This is overlain by a poorly exposed red flow which may be less than 10 feet thick. A grey flow 40 to 50 feet thick with a highly amygdaloidal top overlies the thin red flow.

The visicles of this flow top have been flattened and are up to several feet in diameter. The vesicles have been filled or partially filled with quartz, some calcite, and occasional small blebs of chalcocite.

The geochemical survey consisted of 86 soil samples that were taken in two suitable areas. The samples were colorimetrically analyzed in the field for total heavy metals.

The electromagnetic survey employed a signal broadcast from Seattle, Washington, at 18,600 cycles per second. This survey resulted in the detection of 28 conductors. Anomalies 15 and 17 were considered to be the most promising. Anomaly 15 is sharp, of moderate strength, and may coincide with a fault. Anomaly 17 is a north-trending conductor of unknown character.

Diamond drilling was recommended to test the above anomalies, particularly No. 17. In addition, 7 other anomalies were considered to possibly merit drill tests. The induced polarization method was suggested as a possible method for further investigation of anomalies in areas of swamp or deep overburden.

Galena Holdings Ltd. (DON 1-22 claims)
(76-N-13; about 67° 53'25"N, 109° 58'W) (Lead)

This property at Galena Point in Bathurst Inlet covers showings which were first described by O'Neill (1924) and later by Lord (1951, p. 154). Schiller (1965, p. 8) gives some further notes on the property. In July 1961, 10 claims were staked to cover the main showings. In 1963 a crew excavated 9 trenches on claim DON 1. In April 1964, a further 12 claims were added to the property. During the 1964 season one trench was excavated on claim DON 2 and some of the trenches of the previous season were enlarged.

During the summer of 1966 it was reported that the company planned to make a shipment of about 400 tons of galena by barge from its property at Galena Point, in Bathurst Inlet, to Hay River. It was estimated by the company that the shipment, of essentially pure galena, would be worth $250-$300 per ton.

A shipment of 111 tons were made to Cominco Ltd., Traill, B.C. The shipment graded 75% Pb, 0.8% Zn and 1.3 oz./ton Ag and was valued at $16,240 prior to deduction of treatment charges.

A diamond-drilling program consisting of a total of 757 feet in 7 holes was carried out on the property May 23 to June 1, 1968. The galena-bearing quartz veins on the property generally strike northeast and dip steeply to the west. The veins are commonly up to 6 inches wide, but are occasionally 2 or 3 feet wide, and one vein is 7 feet wide. Minor chalcopyrite and sphalerite are present in the veins but galena is the predominant sulphide and is essentially massive in the wider portions of veins. The veins cut massive granite.

The largest vein that has been discovered is on the north shore of the island just off of Galena Point. The vein is about 6 feet wide at the shore and narrows to a width of 2 feet at a distance of 75 feet from the shore.

The locations of the drillholes are recorded in the table on page 109. However, the origin of the grid is not, unfortunately, known.

Hole No.	Latitude	Departure	Azimuth	Inclination	Depth (ft.)
68-1	0+30N	0+85W	121°	45°	83
68-2	0+30N	0+85W	121°	65°	158
68-3	0+30N	0+25E	301°	57°	130
68-4	1+70S	1+08W	121°	45°	161
68-5	5+97S	0+00	331°	50°	90
68-6	6+76S	0+42W	333°	45°	69
68-7	6+23S	7+80W	15°	50°	66

Holes 3, 4 and 7 intersected granite and a number of quartz veins which were almost completely barren. Holes 5 and 6 intersected the downward extension of veins which had been investigated by trenches. Holes 1 and 2 intersected the main vein at depths of 71 and 96.5 feet, respectively, but the vein contained only minor sulphide where it was intersected by the second hole. Assay results for the intersection in hole No. 1 are as follows:

Depth(ft.)	Cu(%)	Ag(oz./ton)	Zn(%)	Pb(%)
71.2-72.2	0.49	1.2	3.85	62.4
72.2-73.0	0.42	tr.	0.10	tr.

The drilling thus indicated that the veins are of variable width and poor continuity. Drilling was not done directly below the main zone of mineralization, but holes in the vicinity were not encouraging.

Trans-Canada Oils Ltd. and Moresby Mines Ltd. (COT 1-24 claims)
(76-J-11; about 66° 42'15"N, 107° 27'W) (Gold)

This property is located in the Bathurst Inlet area near the Tinney Hills toward the south end of the inlet. The claims cover a gold occurrence of the Contwoyto Lake type (see Baragar and Hornbrook, 1963, pp. 13-22; Schiller and Hornbrook, 1964a, pp. 10-16; Schiller and Hornbrook, 1964b; Schiller, 1965, pp. 12-14; Bostock, 1967; Bostock, 1968; and Tremblay, 1967). This property was originally staked as the OX 1-10 claims by Canadian Nickel Ltd. in 1964 and was described briefly by Schiller (1965, p. 8). These claims subsequently lapsed and the showings were restaked in 1967 for Trans-Canada Oils and Moresby Mines. The name of the former company was changed (Jan. 1969) to Trans-Canada Resources Ltd.

The general geology of the area has been given by Fraser (1964). The showings consist of sulphide and sulpharsenide mineralization disseminated in amphibolite bands in metamorphosed sedimentary rocks of the Yellowknife Group. Coarse arsenopyrite "grains" or porphyroblasts up to about 3/4 cm across are scattered throughout the amphibolite and appear from gross morphology to be individual crystals. When viewed microscopically, however, the "grains" are discovered to consist of a great number, probably of the order of several hundred in the case of some of the larger grains, of individual arsenopyrite grains cemented by chalcopyrite. This suggests that the original grains or crystals have been thermally or hydrothermally recrystallized. The arsenopyrite includes small pyrrhotite, and possibly loellingite, inclusions. Some of the arsenopyrite "grains" appear to have

been almost completely replaced by pyrrhotite and, rarely, by chalcopyrite. Pyrrhotite as disseminated grains and massive streaks appears to be abundant in some of the amphibolite; this appears to be especially true adjacent to conformable quartz stringers.

The showings on the property were investigated by considerable trenching during the 1968 season. Exposure on the property is very good.

The Yellowknife Group rocks consist of thinly bedded and somewhat metamorphosed greywacke, quartz-biotite schist, amphibolite, argillite, and garnet and sillimanite nodular schists. A rock which is probably best described, as at Contwoyto Lake, as a "garnet-cummingtonite-quartz-sulphide gneiss" forms discontinuous lenses, seldom more than a foot thick or 50 feet in length, interbedded with the other sediments. This rock is fine to coarse grained and is characteristically rusty weathering, black and tough. These sulphide-bearing lenticular beds are locally gold-bearing and sometimes occur in groups within the metasediments to form general zones. Pyrite and pyrrhotite are the main sulphides, although arsenopyrite is abundant in places and chalcopyrite is generally present as a minor constituent. In a few beds tiny seams and layers of massive chalcopyrite were noted.

The metasediments strike about N30° W and dip about 45° to the east. The mineralized showings are reportedly located in a large flexure which is apparently superimposed on the west limb of the syncline. Vertical strike faults are suspected to be present. The rocks are cut by a regional series of closely spaced and nearly vertical fractures.

A total of 69 samples were taken for assay from the 13 trenches and as grab samples from the showings. The assay results for these samples ranged from a trace to maximum values of 0.35 oz./ton Au across 0.9 feet in Pit 5 and 0.86 oz./ton Au across 2 feet in Pit 4. Chalcopyrite was exposed in Pits 12 and 13. The assays from Pit 4 indicate a grade of 0.307 oz. Au/11 ft. (or 0.273 oz./13.1 ft.) across the mineralized strata.

The main mineralized area is located on claim COT 15 at about 66° 42'10"N, 107° 26'40"W. The mineralization is distributed across a zone about 500 feet wide extending southeast across the claim from its northwest corner. A more copper-rich zone, which is approximately parallel, is located on claim COT 4 about a mile to the north (approximately 66° 42'40"N, 107° 26'W)

Detailed geological mapping of the property, especially of the structural features, has been recommended. A detailed magnetometer survey of the northwest part of claim COT 15 was also recommended to locate the sulphide concentrations accurately. Not all the mineralized zones were trenched in 1968, and further trenching was recommended to evaluate all of these zones.

ELU INLET AREA

Work was started by Roberts Mining Company in the Hope Bay area late in the 1964 season when several gold showings were located. A small, but rich, showing of native silver was discovered by the company during the 1965 season. In 1966 a second silver showing and a highly regarded gold showing were found on the Arctic Coast and were investigated by trenching.

These discoveries resulted in staking in the area by a number of companies and Conwest Explorations, International Mine Services, Giant Yellowknife Mines, and Radiore Uranium Mines were active in exploration in

1967. The Hope Bay Syndicate was formed prior to the 1967 exploration season to take over the properties of Roberts Mining Company in the Hope Bay and Bathurst Inlet areas. The Hope Bay Syndicate investigated gold and silver showings in 1967 and 1968, by methods including drilling, but the results were generally disappointing.

Hope Bay Syndicate (Various claim groups)
(77-A-3, 6; Hope Bay area) (Gold, Silver)

The Hope Bay Syndicate was formed to option or purchase the property held by Roberts Mining Company in the Bathurst Inlet-Elu Inlet area, when the latter company ceased exploration in the Northwest Territories at the end of the 1966 season. The Hope Bay Syndicate consists of Lynx-Canada Exploration Ltd. (50%), O'Brien Explorations Ltd. (20%), Cliffs of Canada Ltd. (10%), Hathaway Metal Mines Ltd. (5%), with private interests holding the remaining 15%. A total of $137,000 was budgeted for exploration of the various properties in 1967. Detailed mapping, soil sampling and limited diamond drilling were planned.

"Ida Point" gold showing (RUS claims) (about 68° 14'30"N, 106° 34'W)

This claim group consists of claims RUS 1-77, 55 and 56. The gold showings are just east of Hope Bay, on the Arctic Coast of Elu Inlet. These showings were staked by Roberts Mining Company after they were discovered in July 1966. The showings are located on claims RUS 1-4. The property was visited by the author on August 22, 1966.

The showings consist of gold-bearing quartz veins along shears in greenstone, and, to a lesser extent, of mineralization disseminated in the shears. The greenstone shows good pillows in part, and where the pillow lava is exposed at the shore it appears to strike about N20° W and dip 75° SW. The volcanic rocks have been cut by shears in random directions, although many seem to belong to north-south and northeast-southwest sets. Some shears have been traced for at least 1,000 feet, although some displacement by crosscutting shears makes continuity conjectural in many cases. A very large number of mineralized shears are present within the area of several claims, and a number of these extend into the ocean to the north. Visible gold may be seen in the veins at a number of places.

The shear zones generally are host to quartz veins ranging up to about 10 feet in width. A number of the veins consist of fine-grained sugary white quartz with arsenopyrite-rich bands along their margins. In part the arsenopyrite is very fine grained and in part it is in small needle-like prismatic crystals. The arsenopyrite probably carries most of the gold values where the veins are narrow, but in the wider veins small specks of visible gold are common in this type of quartz. The arsenopyrite bands along the vein margins have in some cases formed by partial replacement of the sheared wall-rock.

In some veins the quartz is coarse grained, glassy to milky white, and contains some coarse-grained arsenopyrite and pyrite, and rarely visible gold. Sampling of initial trenches on the showings gave very encouraging results. Some of the highly sheared zones which lack quartz veins have also been found to contain gold values, probably associated with finely impregnated

arsenopyrite. Some of these shears are very finely broken and highly weathered at the surface, which makes their evaluation by trenching very difficult.

During 1967 the Hope Bay Syndicate did further trenching and sampling of the showings and carried out a program of shallow drilling. The shear zones give good core recovery from shallow depth, apparently because cementing carbonate has not been removed by weathering to any significant depth. This shallow drilling indicated that the quartz lenses and veins containing the best gold values are very irregular and discontinuous. This result was very discouraging in view of the considerable continuity of some of the shearing and some of the quartz veins.

The best assay results from a number of shallow holes drilled in 1967 were as follows:

Hole No.	Intersection	Core length(ft.)	Ag(oz./ton)	Au(oz./ton)
H-1	7.5'-9.4'	1.9	0.20	0.52
H-2	22.5'-23.5'	1.0	0.34	2.10
H-9	23'-27'	4.0	0.38	0.32
H-11	8.5'-10'	1.5	0.36	0.46

No. 1 Silver Showing (VAN 1-18 claims) (about 68° 11'N, 106° 32'30"W)

This property is about 6 miles northeast of Hope Bay in the vicinity of Elu Inlet. The No. 1 silver showing was discovered by Roberts Mining Co. during the 1965 season. The VAN claims and other properties in the Bathurst Inlet-Elu Inlet area were acquired by the Hope Bay Syndicate prior to the 1967 exploration season, after Roberts Mining Co. had completed its 4-year program of exploration in the Northwest Territories.

The silver showing is located on claim VAN 4 and was investigated by Roberts Mining Co. in 1966 by trenching along its length. Extensions to the very high grade section of the vein, which is only 12 feet long, were uncovered both to the east and to the west. The extension to the west is 10 feet long and some galena, but no native silver, is evident. An assay of 262 oz./ton Ag is typical. An 8-foot extension toward the east diverges slightly from the main shear and contains good native silver. Assays of 749 and 992 oz./ton Ag have been obtained over one foot widths.

An induced polarization survey was conducted near the showing in 1966 by McPhar Geophysics on behalf of Roberts Mining Company. A detailed grid was surveyed using 50-foot and then 10-foot electrode spacings. A traverse along the vein gave a weak but definite anomaly with an electrode separation of 10 feet, but only very weak responses were obtained in traverses across the vein. Geological mapping of the VAN claims was done in 1966 at a scale of 1,000 feet to the inch, and the silver showing was mapped at a scale of 100 feet to the inch.

In 1967 five holes totalling 78 feet were drilled by the Hope Bay Syndicate to test the No. 1 silver showing. The drilling indicated that the silver content of the vein decreased considerably with depth. Silver mineralization was traced along the vein for a total length of 50 feet. Abundant silver is generally confined to a band of breccia about 1/2 foot wide which follows the north side of the fracture. The best mineralization is restricted to a section of the vein 30 feet long which is reported to average 140 oz./ton

across a width of 2 1/2 feet. A section of the vein 10 feet long averaged 570 oz./ton Ag across a width of 2.4 feet.

Mapping was done in the vicinity of the showing at 40 feet to the inch. Mapping at a scale of 400 feet to the inch was done in the area of the VAN claims and north to the coast to include the "Ida Point" gold showing. More trenching was recommended on fractures which parallel the silver vein.

In 1968 some very detailed induced polarization surveying was carried out by Seigel Associates Ltd. on the silver showing and on other fractures in the vicinity.

No. 2 Silver Showing (RUS claims) (about 68° 13'30"N, 106° 31'30"W)

Prospecting for 7 miles to the north and south of the No. 1 showing (to the Arctic Coast on the north) failed to locate any additional silver veins during the 1965 season or early in 1966. Finally, however, several silver veins were found right on the Arctic Coast and the RUS group of claims, covering newly discovered gold showings, was extended to cover them. These veins were termed the No. 2 silver showing.

The main vein of the No. 2 showing contains about 40% native silver as the cement to a greenstone breccia over an area about 1 foot wide by 2 1/2 feet long. The silver is untarnished and, until examined closely, resembles calcite or any other white mineral. A ring of stones on the barren flat outcrop indicates that an Eskimo family camped within a few feet of the main mass of silver exposed on the surface. The veins of this showing are similar to those of the Echo Bay Mine, Great Bear Lake, in that pink calcite, chalcopyrite, galena and sphalerite are present. Breccia consisting of fine rock fragments and of "ghost" fragments, which have been replaced by carbonate or, rarely, silica, in a matrix of carbonates of various shades, also have their counterpart in the Echo Bay veins.

The No. 1 and No. 2 showings are located along the eastern edge of a north-south trending greenstone belt (Fraser, 1964) near the contact with granitic rocks to the east. At the No. 2 showing the greenstone is cut by a multitude of pink granitic dykes, some rather wide, and the resultant pattern on the water-washed smooth outcrop is most striking when viewed from the air. These silver showings appeared to be of very limited size and presented a very frustrating problem of evaluation.

In 1966 an induced polarization survey, conducted by McPhar Geophysics near the No. 2 silver showing, indicated a weak but definite anomaly. Strong anomalies were detected on several grid lines and were considered to indicate a northeast-trending zone that merited further work.

In 1967 the Hope Bay Syndicate did some trenching and shallow drilling on the No. 2 silver showing. The veins comprising this showing strike about east-west. Just to the southwest of the vein containing the large mass of native silver, the trenching opened up a vein, a few inches wide which contains abundant sphalerite and galena. The sphalerite is, in part, very light greenish in colour. To the south of this trenching was done on a vein which contains considerable native silver across a width of 2 to 3 inches. Silver is abundant in the vein for a length of only a few feet. The fracture passes beneath muskeg to the west.

Work on the main vein of the No. 2 showing traced the mineralization for about 80 feet. At the east end of the vein a sample across a width of 0.7 feet assayed 298 oz./ton Ag. In a trench 45 feet to the west an assay of

2,513 oz./ton Ag across 3.2 feet was obtained. A diamond-drill hole 15 feet west of this gave a 1 foot intersection which assayed 154 to 300 oz./ton. A trench 10 feet farther west gave an assay of 9.7 oz./ton Ag across a width of 0.5 feet.

Geochemical soil samples were taken in the vicinity of both the No. 1 and No. 2 silver showings but the results of this sampling are not known.

In 1967 the Hope Bay Syndicate drilled 19 shallow holes totalling 530 feet on the No. 2 silver showing. The results of this drilling were as follows:

Hole No.	Intersection	Core length(ft.)	Ag(oz./ton)
S-1	3.3'-6.6'	3.3	27.5
S-2	0' -5.0'	5.0	12.62
S-3	10.0'-12.5'	2.5	14.9
	12.5'-15.0'	2.5	15.6
S-10	24.0'-25.0'	1.0	153.7(300.7 check assay)
	25.0'-27.0'	2.0	9.76
S-11	15.5'-16.5'	1.0	22.5
S-18	3.8'-8.5'	4.7	13.1
S-19	2.5'-2.7'	0.2	massive native silver
	2.7'-6.0'	3.3	7.52

In addition to the drilling, 7 trenches were excavated on the showing. Detailed mapping was done at 10 feet and at 100 feet to the inch.

APA 1-20 claim group

The Discovery showing is located on claims APA 5 and 6 and has been described by Thorpe (1966, p. 45). The showing is located at approximately 68° 06'40"N and 106° 42'25"W and consists of mineralized quartz veins within a rusty shear zone that was traced for about 2,000 feet. Abundant arsenopyrite and some pyrite are present in the quartz veins. One of the trenches on the showing yielded a chip sample which assayed 0.39 oz./ton Au across a width of 7 feet and a later channel sample which assayed 0.23 oz./ton Au across a width of 4 feet. A sample taken in 1967 by the Hope Bay Syndicate assayed 2.72 oz./ton silver.

One north-south induced polarization traverse was run over this showing by McPhar Geophysics in 1966. This traverse resulted in the detection of one definite anomaly.

CAR 15-30 claim group

The Angie and Noel showings on this group of claims have been described by Thorpe (1966, p. 45). The Angie showing is located at about 68° 06'N and 106° 43'20"W, and consists of mineralized quartz veins along the contact between dacitic volcanic rocks and black slate. The quartz veins are up to 1 foot wide and contain dolomite or siderite, pyrite, sphalerite, galena, chalcopyrite, pyrrhotite, bournonite and boulangerite. Five trenches on the main mineralized zone, which is 5 feet wide and about 200 feet long, gave only low gold values. However, silver values are reported to have

ranged from 0.16 to 8.58 oz./ton Ag and a selected grab sample is reported to have assayed 0.35 oz./ton Au and 20.35 oz./ton Ag.

WEL 1-7 claims

The granite showing on this claim group is located at about 68° 10'15"N and 106° 31'15"W. This showing was investigated by trenching by Roberts Mining Company in 1965 and 1966. The showing consists of wide quartz veins within a schistose greenstone remnant in granite along the east contact of the Hope Bay belt of volcanics. In places the schistose greenstone has been highly replaced by ferruginous carbonate. The quartz veins can be traced for about 800 feet. Near the north end of their exposed length the veins are very white quartz and contain very pale yellow pyrite. The quartz is darker at the south end of the showing. The best assay values obtained from five trenches excavated on the showing in 1966 are listed below. Some additional chip sampling of the showing was done by the Hope Bay Syndicate in 1967.

Trench	Sampled	Sample width(ft.)	Ag(oz./ton)	Au(oz./ton)	
1	1966	4	1.40	2.92	
		3	0.50	1.50	
	1967	2	0.26	1.28	
PS1	1966	2		1.36	
2	1966	5		0.30	
	1967	2	0.28	1.20	
3	1967	1.3	0.12	0.48	} adjacent sections
		2	0.20	0.48	
		2	0.36	0.44	
5	1966	3		0.58	

The showing was mapped by Roberts Mining Company in 1966 at a scale of 50 feet to the inch. It was remapped by the Hope Bay Syndicate at 20 feet to the inch in 1967. Seventeen chip samples taken from the showing in 1967 assayed mostly 0.10 to 0.28 oz./ton Au, assays which were better than this are listed in the table above.

BRICK 1-4 claims

The showing on this property is located at approximately 67° 51'N and 106° 24'W. This showing within the Hope Bay greenstone belt is about 500 feet from the contact with granitic rocks to the east. Some granitic material has been injected into the greenstone on the BRICK claims.

Geological mapping near the showing was done by Roberts Mining Company in 1966 at the scale of 50 feet to the inch. Two grab samples from the mineralized vein on the property assayed 1.00 oz./ton Ag and 0.06 oz./ton Au, and 0.42 oz./ton Ag and a trace of gold. The results of channel sampling, probably done in 1967 by the Hope Bay Syndicate, gave the following:

Width sampled(ft.)	Au(oz./ton)	Ag(oz./ton)	Cu(%)	Zn(%)
5.5	tr.	0.32	0.15	0.95
4.5	tr.	0.30	0.15	1.40
5.0	nil	tr.	0.20	1.20
7.6	nil	0.30	0.10	1.20
3.0	0.04	0.10	0.10	1.10
9.0	0.02	0.26	0.10	1.05
3.0	0.54	0.80	0.05	0.75

HER 1-4 claims

The showing on these claims, approximately 68° 06'30"N and 106° 31'27"W, consists of a quartz vein 1 foot to 1 1/2 feet wide which strikes N45° E, and dips 20° to 35° SE, in a sequence of greenstone and greywacke. The showing is about 1,000 feet from the contact with granitic rocks to the east.

The vein was investigated by Roberts Mining Company in 1966. It contains pyrite, dark brown sphalerite, galena, chalcopyrite and pyrrhotite. Massive sphalerite is present in the vein in places. Two samples, each across 1 1/2 feet, were reported to have assayed 0.18 oz./ton Au and 11.36 oz./ton Ag, and 0.26 oz./ton Au and 28.76 oz./ton Ag. Three representative samples were taken, each across a width of 2 feet by the Hope Bay Syndicate in 1967 and these assayed 2.36, 1.80 and 1.20 oz./ton Ag.

Detailed geological mapping was done in 1966 over the small outcrop area in the vicinity of the showing. An electromagnetic survey was conducted over a grid in the vicinity of the showing, and three induced polarization traverses were also run on a test basis.

WAN 15-46 claims (76-O-16, 77-A-3; about 68° 01'N, 106° 27'30"W)

These claims were staked for the Hope Bay Syndicate in 1967 following discovery of two gold showings that season by a prospector, W. Lahti. The showings are located near the east contact of the Hope Bay greenstone belt. They are northeast-striking quartz veins about 1,000 feet apart which cut greenstone and alternating granitic bands. The north vein is located at 68° 00'00"N and 106° 28'00"W, and the south vein at 67° 59'45"N and 106° 27'45"W. The lenticular masses of quartz are exposed intermittently for 300 feet and average 4 feet in width. The quartz contains pyrite, chalcopyrite, and some galena. The vicinity of the veins was mapped at a scale of 40 feet to the inch. A sample from the north vein across a width of 5 feet assayed 0.05% Cu, 0.94 oz./ton Ag and 0.38 oz./Au. Two representative samples from the south vein assayed as follows:

Width(ft.)	Cu(%)	Ag(oz./ton)	Au(oz./ton)
5	0.16	0.28	0.44
5	0.31	1.48	2.04

BEC 1-36 claims (76-O-16; about 67° 56'N, 106° 27'W)

The Gunn gold showing was discovered here in 1967. H is located at approximately 67° 56'25"N and 106° 28'W. The assay results for samples from this showing are not known.

Gold Showings (76-O-9)

Two small gold showings were located in this area, near the south end of the Hope Bay volcanic belt, early in the 1967 season by Noel Avadluk and his wife Angie. The Eskimo family was prospecting for the Hope Bay Syndicate.

The No. 1 and No. 2 showings are located at about 67° 32'55"N and 106° 19'W, and 67° 32'15"N and 106° 17'25"W, respectively. Both showings are in greenstone and consist of quartz veins containing visible gold. The No. 1 vein strikes northwest and was traced for about 110 feet.

Trenching was apparently done on these veins in 1968, but the results of this work are not known.

Radiore Uranium Mines Ltd. (RAD 1-60 claims)
(77-A-3; about 68° 01'10"N, 106° 46'15"W) (Gold)

This property is located near the west contact of a volcanic belt in the vicinity of Hope Bay on Elu Inlet. The general geology of the area has been mapped by Fraser (1964).

A small but relatively high grade gold vein was found on this property by prospecting during the 1967 season. Preliminary sampling of a series of trenches indicated a grade of 2 oz./ton Au across an average width of 1.4 feet and for a length of 1,200 feet (The Northern Miner, Aug. 31, 1967, p. 2). The vein is in a northeast-striking fracture in the intermediate to basic greenstone lavas.

Three longitudinal trenches were excavated along the relatively narrow vein. Trench No. 1 is 35 feet long and samples indicated an average grade of 1.08 oz./ton Au across a width of 4 feet for the length of the trench. Trench No. 2 is 395 feet to the southwest and an average grade of 0.98 oz./ton Au across a width of 3.3 feet was indicated for the 25-foot length of the trench. Trench No. 3 is 45 feet long and some good visible gold was observed in the vein in this trench, but the trench could not be sampled due to flooding.

International Mine Services Ltd. (CIC 1-38 and DIP 1-52 claims)
(77-A-3; about 68° 03'N, 106° 39'W) (Silver, Copper, Gold, Cobalt)

Prospecting was done in this area for Roberts Mining Company in 1965. Chalcopyrite-bearing quartz veins which were surface stained by cobalt bloom were found near the river flowing into Hope Bay. Three samples across adjacent 3-foot widths were reported to have assayed 0.44, 0.81 and 2.83% Co.

Geological mapping of the CIC group and of claims DIP 6-12, 15, 19, 20, 27 and 32 was done for International Mine Services July 28 to

September 8, 1967. A number of showings were located by prospecting on the CIC group, and these were investigated by trenching and sampling with results as listed below.

Showing	Claim	Latitude	Longitude	Au(oz./ton)	Ag(oz./ton)	Cu(%)
South 3	36	68° 02'25"	106° 36'55"	0.36	0.4	
East 2	14	68° 03'52"	106° 38'30"	0.24	9.0	
East 5	21	68° 02'35"	106° 38'30"	0.12	7.0	
				0.12	26.6	
				0.20	2.9	
East 8	32	68° 02'29"	106° 38'27"	tr.	15.2	
North 1	3	68° 03'42"	106° 39'40"	0.12	0.3	
North 2	4	68° 03'45"	106° 40'05"	0.32	0.1	
North 3	4	Nearly identical to above		0.20	1.0	
North 5	5	68° 04'06"	106° 40'30"	0.12	26.0	
				0.12	17.0	
North 13	7	68° 04'10"	106° 40'50"	0.04	12.4	7.68
				0.04	11.72	6.26

Showing South 3 consists of a quartz-carbonate breccia vein which strikes N20° E and dips 50° east. The vein is about 1 foot wide and has been traced for 500 feet. The vein was reported to contain pyrite, arsenopyrite, galena, chalcopyrite and jamesonite(?).

The East 2 showing has been reported to consist of a quartz breccia vein 1 foot wide and 50 feet long in green to yellow quartzite. The vein strikes S5° E, dips 45° (?) east, and contains galena, arsenopyrite, pyrite and marcasite.

East 5 showing is a quartz-carbonate zone in greenstone which has an associated gossan. The zone was reported to contain galena, arsenopyrite, bornite and sulphosalt minerals, probably boulangerite and tetrahedrite.

The East 8 showing is a quartz-carbonate vein in pillowed greenstone. The vein contains arsenopyrite and sulphosalt minerals. North 1 showing consists of a vein of dark quartz 2 feet wide, and of unknown length, in feldspar porphyry. The vein contains marcasite and a soft dark mineral, probably a sulphosalt mineral.

Showing North 2 consists of a mineralized fracture 3 inches wide and 200 feet long. The vein contains quartz, calcite, fluorite, pyrite and arsenopyrite. The North 3 showing is an extension of the same fracture-filling vein. This vein consists of quartz and some fluorite, galena, sphalerite, arsenopyrite, pyrite and chalcopyrite in a sheared fracture zone in feldspar porphyry. Some arsenopyrite needles are present in the wall-rock. The mineralized fracture is 1 1/2 feet wide and 200 feet long.

The North 5 showing consists of galena, arsenopyrite, pyrite, chalcopyrite and a sulphosalt mineral (tetrahedrite?) which occur as massive patches and disseminations in a zone about 120 feet long and 1 foot to 3 feet wide in quartz-feldspar porphyry. The quartz-feldspar porphyry along the mineralized zone is cut by a series of narrow quartz veins. The metallic minerals comprise about 10 per cent of the mineralized zone.

Showing North 13 is a vein of grey and white quartz which strikes N80° E and dips 45° south. The vein is 1 foot wide and cuts feldspar porphyry. Chalcopyrite, cosalite and arsenopyrite form up to 60 per cent of the filling of the vein.

A quartz vein on claim DIP 12 is 3 feet wide and 450 feet long. This vein contains a little chalcopyrite with associated cobalt bloom. The vein curves along its strike. A showing 1 foot wide and 100 feet long which consists of galena, chalcopyrite and minor sphalerite in the calcite cement to a greenstone breccia is apparently located on claim DIP 27.

The geological mapping indicates that a mylonite zone is present at the southeast corner and along the east side of "Angie Lake" (approx. 68° 04'30"N, 106° 38'20"W). This mylonite zone strikes S15° E to S10° W and dips about 80° east. The outcrops in the central and southern parts of the CIC group are dominantly acidic porphyries. These rocks were considered to be acidic volcanics.

An area of conglomerate was mapped west of the south end of "Angie Lake" and just west of the river flowing into Hope Bay. The conglomerate has been sheared and cut by veinlets of quartz, siderite or ankerite containing a few per cent chalcopyrite. Some veinlets contain massive pyrite, and arsenopyrite and cobalt bloom are present here and there. Samples taken from an area 4,000 feet long and up to 1,000 feet wide assayed a trace of gold and up to 0.3 oz./ton silver.

International Mine Services Ltd.
(OZ 1-30, FOX 1-29, HIN 1-30, and TOD 1-12 claims)
(77-A-2; about 68° 11'N, 105° 57'45"W) (Molybdenum)

This 101-claim property is along the west contact of the easterly of two volcanic belts in the Hope Bay-Elu Inlet area (Fraser, 1964). This volcanic belt is narrower and has been more highly metamorphosed than that at Hope Bay to the west. The claims were staked in 1966 to cover molybdenite showings.

The molybdenite is generally found in a reddish phase of "granite", probably diorite, but is rarely found in the metamorphosed basic volcanic rock or amphibolite. In part the molybdenite is associated with very coarse grained, pale coloured, pyrite in quartz veins cutting the "granite". Elsewhere the molybdenite occurs in quartz stringers and disseminated in the granitic rock adjacent to these stringers. Molybdenite is found here and there for a length of 8 miles. In general, however, there is no rock exposed for a considerable width along the actual contact, which could be the most interesting zone. Specimens selected from showings toward the north and south ends of the staked area contained considerable molybdenite, but nothing was found by surface prospecting that was considered to be of economic significance.

Au(oz./ton)	Ag(oz./ton)	MoS_2(%)
tr.	tr.	0.01
tr.	tr.	0.05
tr.	tr.	0.02
tr.	0.2	0.48
0.01	0.2	0.01
0.01	0.2	0.08
tr.	tr.	0.77

The showings were located by prospecting done for Roberts Mining Company during the 1966 season. Further prospecting of the belt was done by International Mine Services in 1967. Samples taken from some of the showings early in 1967 gave the following assay results from page 118.

International Mines Services Ltd. (WOLF 1-9 claims)
(77-A-3; about 68° 02'N, 106° 37'W)

Some prospecting was done on this claim group during the 1967 season. The claims cover several well-mineralized quartz-carbonate zones. One showing is 10 feet wide, can be traced for a length of 500 feet and contains some arsenopyrite, pyrite, and minor chalcopyrite. The zone strikes northeast and is covered with overburden at both ends. A similar zone located some distance to the north is 8 feet wide and is exposed for a length of 400 feet. The zone strikes northeast and dips to the southeast.

ELLICE RIVER AREA

Eastern Mackenzie Syndicate
(A 1-501 claims and Permit Areas 76-I-3, 6, 10, 11) (Uranium)

During the 1967 season G. Bruce operated his Cessna 180 airplane from the abandoned airstrip at Pelly Lake in a search for radioactive anomalies between there and Bathurst Inlet. This reconnaissance work was done for the Northwest Syndicate. Several large radioactive anomalies were detected by the scintillometer or gamma-ray spectrometer equipment that was carried. A number of these anomalies were reported to have given readings of greater than 10 times background (The Northern Miner, Apr. 18, 1968, p. 13). These anomalies were in the vicinity of the Ellice River and claims covering the anomalies were recorded at the end of the season. Silvermaque Mining Ltd. held a 34.7 per cent interest in the Northwest Syndicate and Midland Nickel Corp. was also a participant.

The staking at the end of the season consisted of a total of 564 claims. These claims are located on claim sheets 76-H-14 and 76-I-3. The Eastern Mackenzie Syndicate was formed prior to the 1968 exploration season and acquired the A group of 501 claims, and Permit Areas 76-I-3, 6, 10 and 11 in addition. Eastern Mackenzie Syndicate was formed by Silvermaque Mining (42.75%), Midland Nickel Corp. (21.375%), Voyager Explorations (16.875%), Mackenzie Syndicate (10%), Selco Northern (4.5%) and Noble Oils (4.5%).

In 1968 airborne gamma-ray spectrometer surveying, prospecting, trenching and sampling, and preliminary geological mapping were done. The prospecting work was directed to ground checking airborne anomalies and investigation of some of the long gossan zones in the area. The spectrometer survey was flown along east-west lines spaced 1/4 mile apart and airphoto mosaics were used for ground control. The airborne survey started about June 15 and 2,100 line miles, just over half of the total survey, had been flown by June 25. The airplane was then converted from wheel-ski operation to floats and returned to the area on July 11. A total of 4,032 line miles of survey was flown during the season, of which about 4,000 line miles was on the claims and Permit Areas held by the Syndicate.

Freddy Lake radioactive zone (76-H-14, 76-I-3)

"Freddy Lake" is located at approximately 65° 56'40"N and 105° 11'W. The broad radioactive zone here was located in 1967 and was covered by the staking of the A group of claims. This zone as outlined by the airborne survey in 1968 is 1 to 2 miles wide and extends north from just west of the south end of "Freddy Lake" for about 8 1/2 miles to about 66° 03'N.

The main radioactive zone was outlined on the ground across a width of 400 feet and extends north from near the north tip of "Freddy Lake" for 15,600 feet. The zone is approximately 95 per cent covered by glacial drift and boulder fields. Trenching and sampling was confined to a small area at the south end of the zone.

The trenching indicated that the radioactive mineralization occurs in narrow bands of metamorphosed bedded rocks that are concordant with the pink granitic gneiss country rock which strikes N5° E and dips 60° W. A narrow, radioactive, sheared, feldspar porphyry dyke strikes N27° W and dips 85° W. A radioactive brick red, felsite dyke strikes N10° W and dips 45° E. Assay results, by radiometric method, for a number of samples from the showing were as follows:

Rock type	Sample width(in.)	Spectrometer reading(K-U-Th)	U_3O_8(%)
Quartz-feldspar-biotite gneiss	10	80-50-15	0.028
Sheared feldspar porphyry	16	50-38-8	0.011
Black chlorite schist	8	216-140-40	0.04
Brick red felsite	Grab		0.005
Pink granite gneiss	Grab	U=60	0.013

It has been reported (The Northern Miner, Sept. 19, 1968, p. 17) that assays up to 6 lbs. U_3O_8 per ton, or 0.3% U_3O_8, were obtained for samples from this zone.

Wolf Lake radioactive zone (76-I-3, 6)

"Wolf Lake" is located at approximately 66° 13'45"N and 105° W. The broad radioactive zone lies west of the lake and extends from about 2 miles south of the lake to about 3 1/2 miles north of the lake, for a total length of about 6 1/2 miles. The anomalous zone trends north-south and has a width of about 1 mile.

The radioactive zone was located on the ground and was traced for about 5,500 feet. It is between 1/4 and 1/2 mile west of "Wolf Lake". Approximately 65 per cent of the anomalous zone is mantled by glacial drift and boulder fields. In an area about 600 feet long radioactivity was found to be concentrated in bands of black chlorite schist and in a banded aplite. Some trenching on this zone resulted in the tracing of a banded pink aplite containing a black radioactive centre for 620 feet. This aplite strikes N20° E, dips vertically, and is open at both ends. Sampling of trenches along this aplitic band indicated an average grade of 0.009% U_3O_8 across an average width of

4.7 feet for the length of 620 feet. The banded aplite occurs along the faulted contact between grey and pink granitic gneiss. Samples representing a width of 15 feet of pink granitic gneiss adjacent to and west of the aplite averaged 0.028% U_3O_8. A section of the pink granitic gneiss 20 feet wide located 200 feet northwest of the aplite assayed 0.20% U_3O_8. A character sample of the pink granitic gneiss which was taken across a width of 5 feet assayed 0.008% U_3O_8. Three grab samples of black chlorite schist from the showing gave the following assay results:

U_3O_8(%) Equilibrium	U_3O_8(%) Chemical	U_3O_8(%) Radiometric	ThO_2(%) Radiometric
0.32	0.33	0.46	0.57
0.19	-	0.26	0.30
0.022	-	0.038	0.064

The black chlorite schist bands are garnetiferous and occur spasmodically in the pink granitic gneiss. The radioactivity in the "Wolf Lake-Freddy Lake" area appears to be localized on the pink granitic gneiss side of contacts between pink and grey granitic gneiss.

A second radioactive zone was located in the "Wolf Lake" area approximately 1 mile northwest of the main zone. This zone was traced for a length of 4,000 feet in blocky, uniform, pink, porphyritic, medium grained gneissic granite. Rock exposure in the area is only 10 to 15 per cent. The radioactivity is apparently emitted from joint cracks and is sparsely distributed over a wide area.

Diamond drilling to test the "Wolf Lake" and "Freddy Lake" radioactive zones was recommended by the exploration personnel.

Other Radiometric Anomalies

A number of areas and zones were located by the airborne survey in which relatively weak radioactivity is widespread. One such irregular broad zone is located in Permit Area 76-I-10. This zone ranges from 1 to 3 miles wide and extends from about 66° 40'N, 104° 42'W south for 13 miles to the south boundary of the Permit Area at about 66° 30'N, 104° 47'W. The zone is open to the south. Only low radioactivity, apparently associated with anorthositic rocks, was found by preliminary ground investigation. A grab sample from the weakly radioactive showing assayed 0.012% U_3O_8.

A second area of widespread weak radioactivity is located at about 66° 39'N and 105° 06'W on Permit Area 76-I-11. A similar area is located on Permit Area 76-I-6 at about 66° 25'N and 105° 12'W. A fourth area extends from about 105° 15'W to 105° 21'W at a latitude of 66° 14'N, and northwest from this to 66° 19'N and 105° 27'W. Another zone of weak radioactivity is located east and northeast of "Freddy Lake" and has a north-south extent of about 3 1/2 miles.

Gossan Zones

A number of linear gossan zones are present in the area and are associated with metamorphosed sedimentary bands within the granitic gneissic

rocks and migmatites. These bands of rocks contain pyrite and graphite, and minor amounts of chalcopyrite, sphalerite, magnetite and pyrrhotite. The locations of some of the most significant of these gossan zones are as listed below. The gossans have been numbered for reference purposes.

No.	Permit Area	Approximate Locations		Length of gossan zone (miles)
		N. end of gossan	S. end of gossan	
1	76-I-3,6	66° 17'N, 105° 02'30"W	66° 10'30"N, 105° 04'30"W	8
2	76-I-6	66° 27'N, 105° 05'W	66° 18'N, 105° 10'W	11
3	76-I-6	66° 26'N, 105° 21'W	66° 24'30"N, 105° 23'W	1 3/4
4	76-I-10	66° 37'15"N, 104° 51'W	66° 31'30"N, 104° 53'W	7
5	76-I-10	66° 41'30"N, 104° 57'W	66° 38'30"N, 104° 57'30"W	2 1/2
6	76-I-11	66° 45'N, 105° 03'30"W	66° 41'N, 105° 05'W	5

The mineralization along gossan No. 1 has a width of up to 8 or 10 feet. A selected sample from a trench on the zone assayed trace Au, 0.05% Ni, 0.34 oz./ton Ag, 1.0% Zn and 0.35% Cu. A sample from near the south end of the mineralized zone represented by gossan No. 2 assayed 0.04 oz./ton Au and 0.20 oz./ton Ag. This gossan has been developed on a band of quartz-feldspar-biotite gneiss containing pyrite, graphite, and pyrrhotite. The mineralized band is reported to be associated with anorthosite and amphibolite. The gossan zone widens from 40 feet to several hundred feet in a fold toward its south end. Seven selected grab samples from the zone assayed trace Au and 0.10 to 0.15% Cu.

Gossan No. 4 represents bands of pyrite-bearing biotite granite gneiss which strike N10° W, dip 35° W, and are interbedded with anorthosite. The zone has been mildly folded and was considered to be cut by fractures with northwest and northeast strikes. The zone is 50 feet wide and contains minor chalcopyrite. A selected sample assayed trace Au, 0.20 oz./ton Ag and 0.20% Cu.

The south part of gossan No. 6, located west of a long narrow lake, is 2 miles long and is caused by a mineralized zone 7 feet wide. This zone strikes about N14° E and dips 50° W. A sample taken across a width of 5 1/2 feet assayed 0.15% Cu, 0.45% Pb, 1.0% Zn and 0.40 oz./ton Ag. This mineralized zone is described as a well-banded garnetiferous mafic gneiss containing white feldspar, graphite, pyrite, magnetite and pyrrhotite. The north part of gossan No. 6 lies just east of the long narrow lake. The zone has a similar strike, dips west at 60° , and has a width of 135 feet. Mineralization is reported to consist of disseminated pyrite and pyrrhotite in a silicified green dioritic-type rock. Three samples of representative material taken across a width of 12 feet averaged trace Au, nil Ag, 0.10% Cu and 0.60% Zn.

Stall Lake Mines Ltd. (90%) (K and J claims) (76-I-4)

During the 1968 season this company investigated an area near the Ellice River and just west of a Permit Area held by the Eastern Mackenzie Syndicate. The area extends from about 66° 00'30"N to 66° 06'30"N and from 105° 30'W to 105° 38'W. The K group of 80 claims forms the southern quarter

of this area and the 40-claim J group is located at the very north part of the area. The holder of the remaining 10 per cent interest in these 120 claims is not known.

The claim areas were prospected and tested by geiger counter by traversing east-west lines spaced 1,000 feet apart and the intervening area was prospected along lines at 1/4 mile intervals. This work was done between July 8 and the end of August. From the prospecting work it appears that the area is predominantly underlain by granitic gneiss. No significant mineralization appears to have been located in the area, although geiger counter readings of twice background were obtained in a few places. A few small fragments of angular float containing a little lead and zinc were located on the east boundary of the K group, but their source could not be located.

Midland Nickel Corp. Ltd. (B 1-20, C 6-20 claims)
(76-H-14; about 65° 56'20"N, 105° 12'W) (Uranium)

This 35-claim property located in the Ellice River area lies to the east of the C claims of Hanna Gold Mines. Midland Nickel participated in the reconnaissance exploration program carried out by the Northwest Syndicate in the general Ellice River area in 1967. The B and C groups were investigated in 1968 in conjunction with more extensive exploration in the area by the Eastern Mackenzie Syndicate.

A gamma-ray spectrometer survey was flown over the property along east-west lines spaced about 1/4 mile apart. Approximately 13 line miles of survey were flown and resulted in the detection of a north-south zone of radioactivity about 2 miles long and 1 mile wide.

Prospecting, trenching and sampling was done on the property by a crew of four prospectors. Approximately 95 per cent of the property is covered by overburden and no outcrops were found along the broad radioactive zone.

A weak radioactive anomaly on the western part of the property was investigated by four trenches. Trench D is located about 2,300 feet north and 950 feet west of the other three trenches. The assay results from sampling the trenches are presented in the table below.

Trench	Footage along trench	U_3O_8(%)	Description of rock
A	0-5	0.011	Porphyritic granite gneiss
A	0-10	0.007	Red granite gneiss
A	10-15	0.009	Red granite gneiss, abundant black chlorite
A	15-20	0.008	Red granite gneiss, abundant black chlorite
A	20-27	0.011	Red granite gneiss, red porphyry dyke
B	0-6	0.008	Red granite gneiss
C	0-6	0.008	Very fine grained red granite gneiss
D	0-5	0.008	Pink granite gneiss
D	5-10	0.011	Pink granite gneiss
D	10-17	0.010	Pink granite gneiss

A radioactive mineralized zone exposed on the property of Eastern Mackenzie Syndicate about 200 feet north of the claims of Midland Nickel should have a strike extension to the south on the latter property.

Maria Mining Corp. Ltd. (D 21-40 claims)
(76-H-14; about 65° 58'N, 105° 25'W)

This property is in the Ellice River area and adjoins the southwest corner of the property held by the Eastern Mackenzie Syndicate. The property was also investigated during August and September 1968 in connection with a number of other small properties in the area and with work on claims and permit areas held by the Eastern Mackenzie Syndicate.

The property is approximately 95 per cent covered by overburden. Rocks underlying the property consist of pink and grey granitic gneiss, migmatite, and massive and slightly gneissic granites. The gneisses and migmatites strike about N15° E and dip 35° to 85° west. A reconnaissance gamma-ray spectrometer survey was flown along east-west lines spaced at 1/4 mile intervals and covered a total of about 7 line miles. Some radioactive anomalies were detected at the east boundary of the property, but preliminary ground checking failed to locate the source.

Detailed prospecting and a ground scintillometer survey were recommended.

Hanna Gold Mines Ltd. (C 1-5 claims)
(76-H-14; about 65° 56'30"N, 105° 14'15"W)

This small property in the Ellice River area lies between the property held by Duvan Copper Company and that held by Midland Nickel Corp. The property was investigated in 1968 in the same manner as the property held by the latter company.

The property is approximately 95 per cent covered by glacial till and boulder fields. The airborne gamma-ray spectrometer survey flown over the property failed to locate any radioactive anomalies.

Duvan Copper Company Ltd. (D 1-20 claims)
(76-H-14; about 65° 56'30"N, 105° 15'45"W)

This property was investigated for the company during the summer of 1968 in connection with an exploration program over a more extensive area by the Eastern Mackenzie Syndicate. An airborne gamma-ray spectrometer survey was flown over the property with a Cessna 180 airplane. Flight lines were east-west and at approximately 1/4 mile intervals. The survey located a number of small and weak radioactive anomalies. These anomalies appear to be on the fringe of more intense anomalies located on the claims of Midland Nickel Corp. to the east. Preliminary ground investigation on the property failed to locate any mineralization. A preliminary geological map of the property was prepared at a scale of 1/2 mile to the inch.

CAMPBELL LAKE - SIFTON LAKE AREA

Newmont Mining Corp. Ltd. (GAP 1-547, BAR 1-108 and ART 1-36 claims) (Campbell Lake - Sifton Lake area) (Nickel)

These claims near the boundary between the Slave and Churchill structural provinces and north of the McDonald Fault were recorded in early September 1968. The 691 claims extend for about 13 1/2 miles northeast from Campbell Lake and then north for an additional 8 miles. The claim sheets on which the claims are located are as follows:

Claims	Claim Sheet
GAP 346-368	75-0-2
GAP 369-383	75-0-3
BAR 1-108	75-0-7
GAP 1-345, 384-440, 546, 547	75-0-7
GAP 441-531, 535-545	75-0-9
ART 1-36	75-0-10
GAP 532-534	75-0-16

Newmont conducted a reconnaissance exploration program in the area in 1968 on the basis of aeromagnetic coverage which had been completed by a release of maps by the Geological Survey of Canada in February 1968. The boundary between the Slave and Churchill provinces was considered to be favourable for the discovery of nickel deposits. This postulate was based on analogy with the Thompson nickel belt which is located along the Churchill-Superior boundary in Manitoba; the rocks of the Superior province generally give equivalent geological ages to those of the Slave province. The Newmont claims were staked to cover sulphide zones in the gneissic rocks which contain low-grade nickel mineralization, and the possible strike extension of these zones as indicated by the linear magnetic patterns.

The aeromagnetic maps for the general area indicate that the gneisses of the Slave province give a low and uniform response, while the gneisses of the Churchill province are marked by high magnetic relief and a generally high background. The gneisses of the two provinces have, however, been mapped as a single unit (Wright, 1957, 1967). The Newmont staking covers one, and sometimes two, magnetic bands which give peak responses of 61,000 to 61,500 gammas.

By January 1969, about 7,500 claims had been recorded from the area on behalf of an estimated 30 companies. The potential belt of rocks extends for a length of 145 miles northeast from the McDonald Fault to the major fault zone which extends southeast from Bathurst Inlet. The Slave-Churchill boundary then extends northeast about 170 miles from the latter fault to the Arctic Coast.

Further exploration, including diamond drilling, was planned by Newmont for its property in 1969. Other companies planned airborne and ground magnetometer and electromagnetic surveys on their properties in the same general area, and extending some distance farther north.

WESTERN MACKENZIE DISTRICT

Silver-bearing galena veins on Prairie Creek were investigated by Cadillac Explorations in 1966, 1967 and 1968. Drilling was done on some of the veins and in 1968 an exploratory adit was driven on one of twelve zones of mineralization known on the property. Some good assay results were obtained on drill core and from underground sampling. The driving of further exploratory adits was under consideration for the 1969 season.

Copper-bearing veins or dykes which are exposed in the Liard River and on its south bank were investigated by Ramada Mines and Mt. Hyland Mines in 1967 and 1968. Redstone Mines started work again in 1968 on their properties in the Redstone River area after a break of about three years. Todd Explorations did some exploration on a lead prospect at Inuvik during the report period.

Ramada Mines Ltd. (50%) and Mt. Hyland Mines Ltd. (50%)
(Numerous claim groups and Permit Area 95-G-7)
(95-G-2, 7; about 61° 13'N, 122° 45'W) (Copper)

This property on the Liard River consists of a total of 666 claims. Permit Area 95-G-7 was acquired prior to the 1968 season and included part of the claims as well as protecting the strike extension of the copper showings toward the north. The claims making up this property consist of the following: EB 1-36, HY 1-36, EC 1-36, VI 1-12, FC 1-35, A 1-20, A 1-100, JET 1-9, PAM 1-32, XL 5-16, MOSS 1-16, FAY 1-18, MOLY 3-18, MUNRO 1-24, AND 1-36, WIN 45-80, PIN 9-44, EUREKA 0-19, 5-16, 6-9, 1-16, 17-24, 46-90, 97-99 and LIN 50-97.

Early in 1968 it was reported that an electromagnetic survey was to be conducted over two aeromagnetic anomalies near the centre of Permit Area 95-G-7. The results of this work, if in fact it was done, are not known to the author.

The main copper showing on the property is on an island in the Liard River and on the adjacent south bank of the river. It is located on the LIN group of claims at approximately 61° 11'30"N and 122° 46'35"W. Some drilling was done in 1967 and one hole gave an intersection from 8 feet to 80 feet which averaged 6.60% Cu (The Northern Miner, Dec. 21, 1967, p. 3). Drilling was continued on the property during the early months of 1968 (The Northern Miner, Apr. 18, 1968). It was also reported early in 1968 that an electromagnetic survey was in progress on the property.

The showing consists of chalcopyrite, pyrite and quartz in a northwest-striking fracture zone cutting flat-lying shale and siltstone of the Simpson Formation (Douglas and Norris, 1960). A number of carbonate-rich dykes are associated with the fracturing and mineralization (Roed, 1969). Roed notes that while the entire lower Paleozoic section of carbonates and shales would ordinarily be expected in the area, a hole drilled by Shell Oil about 3 miles north-northeast of the copper showing penetrated only 1,885 feet of Paleozoic sediments before reaching basement rocks of Proterozoic age. Minor amounts of bornite and chalcopyrite occur at a depth of 1,300 to 1,320 feet in this hole (Roed, 1969). A deep hole near the showing is reported to have intersected nearly massive marcasite, and minor chalcopyrite, from 738 to 796 feet in rocks of either the Slave Point or Presqu'ile Formations.

The mineralized fracture zone is up to 80 feet wide and has a known length of 900 feet. The zone is silicified and contains quartz breccia pods and discontinuous dykes up to 2 feet wide. The breccia pods strike about N23° W, dip steeply, and contain silicified shale fragments (Roed, 1969). Chalcopyrite and pyrite are concentrated in the breccia pods. Chip samples across the most continuous band of breccia, 220 feet long and 3 to 5 feet wide, gave an average grade of 2.24% Cu across 3.5 feet. Other breccia bands of the same width and about 80 feet long were sampled. Nine breccia bands are known on the property.

Pyrite and minor chalcopyrite also occur in veins parallel to bedding and as disseminations in silicified shale and siltstone within a few feet of the mineralized breccia bands. Pyrite-bearing concretions are present in the shale. Core from one of the holes drilled to test the showing contained narrow veins with euhedral barite, chalcopyrite and galena.

A number of dykes on the property strike about N18° W and dip 84° west. One of the dykes was studied in detail by Roed. He found that it appeared to consist of finely siliceous dolomite which contains highly shattered pellet-like structures, pods of a light-green carbonatized (?) mineral, and rare altered feldspar crystals. Typical igneous crystalline texture was found to be almost entirely lacking in the dyke rocks. Disseminated pyrite was reported to be abundant in some samples of the dykes.

In 1967 six holes were completed in the vicinity of the showing. The results for hole 5 are not available, but results for the other holes are presented below. All holes were drilled vertically to test the steeply dipping veins.

Hole	Depth(ft.)	Intersection	Core length(ft.)	Core recovered(ft.)	Cu(%)
S1	586	527'-586'	59	29	2.32
S2	22	0'-22'	22	15	1.10
S3	30	0'-30'	30	20	
S4	70	8'-70'	62	48	3.87
S6	110	1'-10'	10	7.8	3.75
		10'-80'	dry sludge only		7.08

Holes S1 and S6 were located on the south bank of Liard River. Hole S1 was drilled vertically and tested the A zone of mineralization. Chalcopyrite in vuggy quartz was intersected toward the bottom of the hole, while a 1-foot intersection of vuggy quartz containing chalcopyrite and sphalerite at a depth of 200 feet assayed 18.7% Zn. Trenches in the vicinity of this hole gave samples which assayed 0.90 and 1.91% Cu, across a width of 3 feet in each case. Hole S6 tested the parallel B zone a short distance to the west. The hole apparently intersected massive chalcopyrite at a depth of 8 to 10 feet, and disseminated chalcopyrite and bornite from 10 to 80 feet.

Trenching was done late in the 1967 season on the mineralized veins where they were exposed during low water in the Liard River. This trenching tested the veins for a length of just over 400 feet. The results of this trenching, from south to north, was as follows:

Trench	Vein	Sample width(ft.)	Cu(%)
2I	Central	3	0.24
1b	East	3	3.39
1c	East	3	0.15
1A	East	4	0.48
2A	Central	3	0.32
2B	Central	5	1.50
2C	Central	3	0.05
3A	West	3	3.98
2D	Central	3	0.26
2E	Central	3	2.87
2F	Central	3	4.74
2G	Central	4	2.49
2H	Central	4.5	5.75

Holes 2 and 4 were drilled in the vicinity of these trenches on the vein exposures in the river.

A series of short holes was reported to have traced the vein system in 1967 for a length of 4,500 feet beyond the 800-foot-length visible at low water. Sixty more short holes on the north bank failed to find any extension in this direction. Late in 1967 a gravity survey was run on grids established on both sides of the river.

In February and March 1968 attempts were made to drill four holes on gravity anomalies on the north side of the river. Two holes went to a depth of about 200 feet but none reached bedrock. Prospecting in 1968 resulted in the discovery of chalcopyrite in quartz veins in float and in cuttings from seismic holes at a location about 10 miles northwest of the main vein.

Recommendations were that a geophysical consultant be hired to study the available results of seismic and magnetic surveys and to select favourable areas, that further drilling be done on the known targets, that geophysical tests be done of the main showings, and that surveys using the selected geophysical method be conducted in the areas considered favourable. It was recommended that any subsequent drilling be to the depth of the Presqu'ile-Slave Point Formations.

Nordic Mineral Development Corp. Ltd. (Prospecting Permit 95-G-16)

This permit area is about 25 miles west of Fort Simpson. The only rocks mapped in the area are shales and siltstones of the Simpson Formation of Devonian age, and similar rocks of Cretaceous age which are overlain by fine-grained Upper Cretaceous sandstone (Douglas and Norris, 1960).

The permit area was acquired prior to the 1968 season on the basis of the identification of sphalerite in cuttings from the Manetoe Formation in three wells drilled in oil exploration in the area. The area was prospected during the 1968 season, but very little outcrop was found.

Penarroya Canada Ltd. (Prospecting Permit 95-G-12)

This permit area is located about 70 miles west of Fort Simpson and 100 miles north of Fort Liard. The geology of the area has been mapped by

Douglas and Norris (1960). Paleozoic sediments ranging in age from Devonian to Carboniferous underlie the permit area. The rocks of the area are only gently folded and the axis of a broad syncline (Yohin Syncline) extends north-south along the valley of the Tetcela River. The lowermost Devonian formations within the permit area are exposed only in Ram Plateau to the south of Ram River.

This permit area was acquired prior to the 1968 season to permit exploration for reef facies sediments in the Middle Devonian sequence. It was investigated July 1-27, 1968, with attention being devoted to the Manetoe Formation which may possibly be equivalent to units 17 and 18 on the map by Douglas and Norris (1960). The Manetoe is considered as probably older than the Presqu'ile-Slave Point Formations of the Pine Point area, and possibly equivalent in age to the Chinchaga Formation. Signs of lead-zinc mineralization of Pine Point type were the exploration target, but nothing of interest was located.

Cadillac Explorations Ltd. (WES 1-134, ASH 1-66 and LCM 1-8 claims) (95-F-10; about 61° 32'45"N, 124° 48'35"W) (Lead, Silver, Zinc)

This property on Prairie Creek in the South Nahanni River area was optioned from J. McAvoy and the late F. Nelson, of Hay River, early in 1966. The WES 1-134 and ASH 31-66 claims, a total of 172, are located on claim sheet 95-F-10 and cover the main showings. Claims ASH 1-30 and LCM 1-8 are located to the south of the above claims and are on claim sheet 95-F-7. The LCM group lies south of the ASH group and was recorded in February 1969. Prior to the 1966 field season a prospecting permit area, 95-F-10, was obtained covering the area surrounding the claims. This permit area terminated on March 31, 1969.

A program of prospecting was carried out in the permit area in 1966. Two bulldozers were also walked-in to the property during the season and some trenching, electromagnetic surveying, and diamond drilling were done. A landing strip was established a short distance upstream from the camp location. Fuel and supplies were landed here by the Twin Otter of Wardair Canada Ltd. in the spring of 1967, before the plane was put on floats for the season.

The 1967 exploration program commenced about midsummer. A very comfortable camp was established at the property. Service to the camp was by Helio Courier airplane from Yellowknife.

The bulldozers were used to establish roads up over the mountains on extremely steep slopes, and to do some trenching and stripping of the veins. An access trail was established to a showing near the south boundary of the permit area where it was reported that good galena mineralization was found in 1966 across a width of 40 feet. This locality is perhaps 7 miles south of the campsite.

Bulldozer stripping on showings north of camp, and east of Prairie Creek, indicated that there are two separate showings. The mineralization here consists of coarse galena, in part with banded-recrystallized deformation structure, and tetrahedrite. Sphalerite appears to be rare at this locality. Four shallow holes totalling 303 feet were drilled with a small-diameter machine in this area in 1966. Only very narrow stringers of galena are evident in the core, but core recovery was extremely poor.

Some electromagnetic surveying in 1966 indicated a strong anomaly in the gravel bar area near the camp. This anomaly is apparently along the strong north-south fault in the area which may be the major controlling factor of the mineralization (Douglas and Norris, 1960). Horizontal-loop electromagnetic surveying in 1967 commenced about August 3. The electromagnetic survey confirmed the anomaly obtained in the camp area in 1966, and grid areas near a number of the showings were also surveyed.

The first showing south of camp and on the west side of Prairie Creek is exposed on a steep slope that is partly covered by talus. The vein appears for the most part to be 4 to 6 feet wide and it is generally conformable to the limestone and shaly limestone country rock which strikes about N20° E and has an average dip of 65° east. Some discontinuous chert bands are present in the limestone. In addition to galena and included large blobs of tetrahedrite, sphalerite of a tan to light brown colour is fairly abundant. Old assay results (dating from 1959, when the showing was covered by the TL group) for four trenches along a length of about 32 1/2 feet out of an exposed length of 40 feet are as follows:

Width(ft.)	Ag(oz.)	Cu(%)	Pb(%)	Zn(%)
2	13.8	0.73	30.85	16.72
3	10.1	1.26	29.26	18.36
5	13.5	0.47	31.36	13.66
6	8.3	-	31.18	3.01

A diamond-drilling program totalling 1,200 feet was carried out late in the 1967 season. Drilling on the main anomaly beneath gravel fill in the steep valley of Prairie Creek was without success; the drilling indicated a thickness of at least 120 feet of gravel. The electromagnetic anomaly has been interpreted as a response to overburden rather than to sulphides. A hole drilled at the base of the hill beneath the showings on the west side of Prairie Creek gave one intersection, but mineralization was only good across part of the width of the vein. Troubles with grizzly bears and the Helio Courier supply plane forced termination of the drilling.

During 1968 most of the known showings were stripped and linked by access roads. Some of the zones were also tested by diamond drilling and an exploratory adit and crosscuts were driven for a total of 1,000 feet of underground work.

Supplies and equipment including a diamond drill, two pick-up trucks, a Jeep and a Haflinger vehicle were delivered to the property by DC 3 and Bristol aircraft at the start of the 1968 season.

The mineralization on the property is considered to be related to a shear zone which strikes N10° E and dips 54° to 60° E. This shear zone cuts argillaceous limestones, with interbedded shale and dolomite beds, which may be of Devonian age. Showings 5, 6, 7 and 8 are located west of Prairie Creek and are along this shear zone. Some of the galena-rich veins (zones 2 and 3) are in subsidiary fractures located east of the shear zone and these strike about N45° W.

Zone No. 1

This zone is located east of Prairie Creek at about 61° 34'07"N and 124° 47'24"W. The showing consists of a galena-rich vein with a strike of about N45° W, approximately parallel to the veins of the No. 2 zone.

A channel sample taken across the 18-inch width of this vein in 1966 assayed 1.43% Zn, 2.77% Cu, 61.78% Pb and 49.65 oz./ton Ag. Precambrian Mining Services suggested from their work in 1967 that this vein was continuous with the No. 2 zone. Stripping of these zones in 1968 indicated that this was not the case. This stripping indicated that the vein narrows to a width of about 4 inches. Two holes were drilled on the showing in May 1968, presumably before the stripping had been done. These holes were drilled to depths of 107 feet and 90 feet and only intersected narrow stringers of galena.

Zone No. 2

This showing is also located east of Prairie Creek and 400 feet southwesterly from the No. 1 zone. This location is approximately 61° 34'05"N and 124° 47'25"W. Some stripping was done on this showing by bulldozer in 1966. The showing consists of two parallel galena-rich veins, one of which attains a width of 4 feet of solid sulphides, which strike about N45° W.

Four holes totalling 303 feet were drilled on this showing in 1966, as noted above. The two veins are parallel for a length of about 50 feet, but at its southeast end the footwall vein curves westerly and can be traced a further 60 feet. At the curve of this vein, pods of massive galena occur between the two veins. Both veins were stripped for a length of 160 feet. The hanging-wall vein has a maximum width of 4 feet where it passes beneath a talus slope. Channel samples taken across a width of 4 1/2 feet gave assay results as follows:

Cd(%)	Zn(%)	Pb(%)	Ag(oz./ton)
0.062	13.25	52.50	35.80
0.056	7.60	64.75	37.00
tr.	8.10	62.70	40.00
tr.	7.90	62.15	37.75

Eleven holes were drilled on this showing in May 1968 and tested it to a depth of 90 feet. The intersections obtained in this drilling are as follows (see page 133):

It was suggested that underground work on this zone for exploration purposes might be more feasible than it would be to continue drifting in this direction from the drift on the No. 3 zone. If underground work is undertaken on the No. 2 zone, an adit from a point well below and to the east of the stripped area is recommended.

Hole no.	Depth(ft.)	Intersections	Width(ft.)	Pb(%)	Ag(oz./ton)
2B-1	110	52'-55'			
2B-2	41	30'-35.6'	4	16.2	38.5
			1.5	59.7	22.4
2B-3	61	44.9'-56.5'			
2B-4	125	97'-101'			
2B-5	75	32'-36'			
2B-6	127	95'-99'	2.5	38.1	14.9
2B-7	93	60'-65'	5	35.2	9.5
2B-8	109	None			
2B-9	111	Stringers only			
2B-10	96	82'-84'			
2B-11	229	Stringers only			

Zone No. 3

This showing is located east of Prairie Creek, about 1/2 mile south of the No. 1 and No. 2 zones, at approximately 61° 33'35"N and 124° 47'30"W. The veins comprising this showing strike from northwest-southeast to about north-south. On surface the main vein is 4 feet wide at the northwest end of the showing. Downhill to the southeast stripping indicated that the vein separated into veinlets across a width of 23 feet. The veinlets join again into a vein 2 1/2 feet wide, split into veins across a width of 54 feet, and again join to form a vein 1 1/2 feet wide.

Twelve holes totalling 1,909 feet were drilled on this showing in June, August and September 1968. The core recovery from the 6 holes drilled in June was very poor, but different drilling equipment was used for the later drilling and core recovery was presumably much better. The results of this drilling are listed below.

Hole no.	Depth(ft.)	Intersections	Comments
3B-1	54	Stringers only	
3B-2	164	Stringers only	
3B-3	60	45'-46'	
3B-4	61	None?	Only 8 ft. of core recovered
3B-5	57	None?	Only 12 ft. of core recovered
3B-6	363	Stringers only	
3B-7	119	Stringers only	
3B-8	180	155'-162'	
3B-9	269	79'-88', 204'-209'	
3B-10	570	None	
3B-11	245	183'-184', 192'-194', 204'-209'	
3B-12	267	132'-134', 160'-162', 185'-190'	

In view of the poor core recovery, apparently less than 40 per cent in drilling early in the 1968 season on the Nos. 1, 2, 3 and 4 zones, underground investigation was considered as a more positive exploration method. The No. 2 zone was selected as a likely target area. The underground work

started on July 18 and was suspended on September 26. This work was under contract to Gremac Ltd. An exploratory drift was driven northwest for about 318 feet on the main vein and was then turned to go north approximately 200 feet more.

Sampling of the Main or No. 1 vein along the drift was done at approximately 5-foot intervals with results as listed in the table on pages 134-135.

At about 85 feet along the drift crosscuts were driven 35 feet to the southwest and to the northeast. The northeast crosscut intersected two narrow mineralized stringers which assayed 0.44% Cu, 1.52% Zn, 23.5% Pb and 9.7 oz./ton Ag across a width of 2 1/2 inches, and 0.64% Cu, 8.32% Zn, 37.5% Pb and 20.4 oz./ton Ag across a width of 4 inches.

At 183 feet from the portal a crosscut driven 67 feet northeast apparently failed to intersect any veins. A crosscut was driven to the southwest about 135 feet and then to the west for about 60 feet. The No. 2 vein was intersected in this crosscut at about 85 feet from the main drift. This is a 4-foot quartz vein which contains some galena and sphalerite. The locus of the vein, however, is highly sheared and the vein is more correctly considered a well-mineralized but highly oxidized shear zone. The vein or shear strikes N5° E and dips 53° to the east. Two grab samples from the vein assayed 0.08% Cu, 4.43% Zn, 2.07% Pb and 6.0 oz./ton Ag, and 0.16% Cu, 15.1% Zn, 10.9% Pb and 2.4 oz./ton Ag. A narrow galena-rich stringer located about 5 feet west of this vein assayed 0.05% Cu, 14.0% Zn, 50.6% Pb and 10.2 oz./ton Ag across a width of 0.5 foot.

The No. 2 vein was intersected in the main drift at approximately 287 feet from its entrance. Five samples from the vein in this area gave the following results:

Width(ft.)	Cu(%)	Zn(%)	Pb(%)	Ag(oz./ton)
4	0.11	9.91	10.0	3.0
3	0.10	1.74	12.8	3.0
3	0.48	8.20	22.9	6.3
3	0.18	5.48	17.6	4.3
3	0.17	2.36	24.0	5.3

This vein was also intersected in a 70-foot crosscut, the No. 3 crosscut, driven east from a point about 400 feet from the portal. Two samples here, each across a width of 4 feet, assayed 0.09% Cu, 3.48% Zn, 10.6% Pb and 3.82 oz./ton Ag, and 0.05% Cu, 3.01% Zn, 3.3% Pb and 1.52 oz./ton Ag. A grab sample from the vein here assayed 0.07% Cu, 0.26% Zn, 71.0% Pb and 17.5 oz./ton Ag. This vein was not mineralized in crosscut No. 4 an additional 100 feet to the north.

The No. 3 vein in the No. 3 crosscut is located about 25 feet west of the No. 2 vein. The No. 3 vein strikes about N10° E and was also intersected by the main drift and by the No. 4 crosscut, which was driven east for 67 feet from about 508 feet from the portal or from the north end of the main drift. Assay results for this vein, distributed for a length of 160 feet, are as listed on page 136.

Approximate distance from adit entrance(ft.)	Width(ft.)	Cu(%)	Zn(%)	Pb(%)	Ag(oz./ton)
14	1.4	0.3		56.6	17.05
19	0.9	7.2		45.8	62.4
	1.2	0.8		32.8	13.2
24	1.0	0.25		46.6	15.85
28	2.9	0.75		41.0	23.75
33	1.4	1.0		18.5	10.7
38	1.4	0.8		33.96	23.85
43	1.0	0.58		21.4	9.8
48	1.0	1.0		32.68	16.85
53	1.0	1.7		44.5	47.9
61	2.0	tr.		51.0	27.05
66	1.4	0.3		39.5	14.8
71	1.0	2.1		28.2	24.75
76	1.0	1.4		27.2	25.6
81	1.0	0.6		55.9	22.3
86	1.0	0.15		42.5	15.7
92	1.0	0.2		25.0	8.4
97	1.0	0.25		49.2	18.3
108	0.3	0.17		40.4	16.5
144	0.1	0.2		37.0	15.85
120	1.0	0.65		64.5	21.5
	1.0	0.55		50.4	17.7
125	0.6	0.4		48.7	15.9
	1.0	2.2		61.4	52.65
132	1.6	0.38		64.5	25.1
138	1.0	0.79		41.3	27.6
143	0.3	0.17		19.43	7.1

Approximate distance from adit entrance(ft.)	Width(ft.)	Cu(%)	Zn(%)	Pb(%)	Ag(oz./ton)
143	0.5	0.6		29.6	16.1
149	0.6	0.22		34.16	12.6
153	0.9	0.24		39.0	12.5
157	0.6	0.36		44.0	13.1
	0.4	0.12		31.9	8.3
163	1.0	0.41		27.43	10.4
170	0.3	0.89		37.55	19.6
181	8.0	0.12		16.3	5.3
187	2.0	0.12		35.8	10.7
200	0.9	0.58		51.7	20.1
205	0.15	0.12		45.7	13.0
211	0.3	0.05		40.0	10.5
217	0.4	0.05		72.1	23.8
223	0.6	0.02		71.5	24.6
230	1.0	0.07		56.9	16.0
237	0.4	0.4		70.2	22.0
	0.3	0.14		62.9	18.0
249	1.8	0.18	2.58	26.11	8.8
254	0.4	0.41	0.98	66.9	24.3
260	6.0	0.72		12.4	10.9
264	0.2	0.20	4.20	35.6	7.7
	0.4	0.53	0.31	34.2	7.6
	0.1	1.54		23.1	36.5
	0.7	0.50		33.2	11.6
270	0.6	0.66	4.87	54.4	27.4
277	0.62	0.48	1.02	42.0	16.7

Location	Width(ft.)	Cu(%)	Zn(%)	Pb(%)	Ag(oz./ton)
Main Drift	4	0.29		24.2	9.2
Main Drift, 5 ft. north	4	0.31		23.0	9.0
Main Drift, 12 ft. north	3	0.20		27.1	9.2
Main Drift, 13 ft. north	3	0.33		30.1	12.4
No. 3 Crosscut, south wall	8	0.15	3.23	27.2	8.0
No. 3 Crosscut, north wall	5	0.18	1.34	38.2	9.3
No. 3 Crosscut, grab		0.14	0.10	80.8	31.1
No. 4 Crosscut, south wall	4	0.31	0.75	31.6	9.8
No. 4 Crosscut, north wall	5.8	0.16	1.44	13.0	4.5

Zone No. 4

This zone consists of a boulder of massive sulphides, with a minimum dimension of 3 1/2 feet, for which the bedrock source has not been located. The boulder, found in 1966, is east of Prairie Creek and southeast of Harrison Creek at approximately 61° 33'25"N and 124° 47'20"W. This locality is approximately 850 feet south of the adit entrance on the No. 3 zone and approximately on strike of the shear encountered in the underground workings on that zone. A sample from the boulder assayed 1.50% Zn, 72.1% Pb and 19.35 oz./ton Ag.

Zone No. 5

This is the main vein that had been investigated in earlier work on the property, as noted above. The vein is exposed west of Prairie Creek at approximately 61° 32'50"N and 124° 47'45"W.

Four pits were excavated on this vein in 1966. These pits were cleared and sampled in 1967. The assay results from sampling of the vein were as follows:

Pit no.	Distance south from north end of vein	Width(ft.)	Cd(%)	Zn(%)	Pb(%)	Ag(oz./ton)
–	nil	3.0		4.9	26.2	8.1
–	55 ft.	3.0		23.2	24.5	9.1
4	95 ft.	2.5		13.8	41.2	16.9
3	120 ft. ±	3.5	0.09	24.1	30.3	20.5
3	120 ft. ±	2.5		9.6	32.3	20.3
2	160 ft.	3.0		20.6	28.4	11.8
1	190 ft.	Vein not exposed				

An electromagnetic survey was conducted on the zone in 1967, and 5 holes totalling 1,223 feet were drilled late in the season. Location and results of these holes are summarized below. Hole A1 was inclined to the east at 45° and the other holes were inclined to the west at the same angle.

The mineralization in this vein was considered to be erratically distributed in pods and no additional investigation was done in 1968.

Hole no.	Distance north of surface exposure	Depth(ft.)	Comments
A-1	1,050 ft.	136	Drilled to test a wide conductive zone in the valley. Abandoned before reaching bedrock.
A-4	520 ft.	401	Graphite and disseminated pyrite at a depth of 200 ft.
A-5	330 ft.	147	Intersected pyrite and graphite.
A-6	140 ft.	351	Intersected 6 ft. vein at 120 ft. containing only minor sulphides.
A-7	nil		Abandoned due to very difficult drilling conditions.

Zone No. 6

This zone is exposed on a steep slope to the south of Galena Creek and about 3/4 mile south of the No. 5 zone. The showing appears to be similar to the No. 5 zone with the mineralization concentrated in pods. The location is approximately 61° 32'00"N and 124° 47'50"W.

Zone No. 7

This showing is located about 1 mile south of the No. 6 zone at approximately 61° 30'45"N and 124° 48'05"W. Stripping was done for a strike length of 700 feet in 1968. The vein is reported to average 5 feet in width for this length. A bulk sample taken in November 1968 across a width of 5 feet in four trenches assayed 0.77% Cu, 4.55% Zn, 14.4% Pb and 11.67 oz./ton Ag. Channel samples taken from the showing in 1966 are reported to have assayed 0.25% Cu, 17.1% Pb, 14.2 oz./ton Ag, and 2.75% Cu, 67.0% Pb and 57.4 oz./ton Ag.

Zone No. 8

This zone was stripped by bulldozer for a length of 980 feet in 1968. The showing is located about 1 1/4 miles south of the No. 7 zone and at approximately 61° 30'35"N and 124° 48'20"W. The results obtained from 10 trenches on the vein are listed on page 138. The individual assays are for adjacent widths in the vein, listed from east to west.

The vein in trench G is considerably oxidized. The sample from trench J apparently represents two veins each 3 feet wide, but the width of intervening unmineralized vein material is not known. Six holes totalling 1,790 feet were drilled along the vein with results as follows:

Hole no.	Location in relation to trench A	Inclination	Intersections	Cu(%)	Zn(%)	Pb(%)	Ag (oz./ton)
8B-1	250 ft. south	40° east	69'-74.5'	0.65	22.8	28.5	15.0
8B-2	250 ft. south	60° east	3 narrow				
8B-3	500 ft. south	40° west	77'-88'	0.12	24.0	21.0	3.2
			88'-97'	0.26	26.8	26.6	6.7
8B-4	500 ft. south	60° west	96'-117'				
8B-5	20 ft. north	40° west	84'-94'	No assay results available			
8B-6	500 ft. south	40° west	nil				

Trench	Distance south of trench A	Width(ft.)	Cu(%)	Zn(%)	Pb(%)	Ag(oz./ton)
A	nil	2	0.10		8.16	2.4
		2	0.19		46.0	12.7
		2	0.46		11.5	8.2
B	95 ft.	7	0.17	16.4	7.4	4.28
C	140 ft.	8	0.13	16.4	16.0	4.48
D	200 ft.	6	0.10	15.8	14.0	4.06
		6	0.21	12.3	14.3	7.62
		8	0.15	13.9	14.2	5.2
E	255 ft.	7	0.73	19.9	21.2	13.8
		3	0.94	17.8	26.6	17.4
		7	0.36	18.9	20.4	9.7
		5	0.11	12.5	5.58	2.46
F	280 ft.	6	0.25	14.0	26.4	9.2
		7	0.31	10.1	23.7	10.2
		4	0.18	4.13	23.7	10.0
G	380 ft.	?	0.14	6.93	9.5	6.1
H	445 ft.	6	0.37	13.8	15.5	8.2
I	475 ft.	7	1.19	21.1	12.0	12.1
J	570 ft.	6?	0.56	9.6	29.4	14.9

Zone No. 9

This showing is located at about 61° 30'00"N and 124° 48'45"W, approximately on the south boundary of Permit Area 95-F-10. This showing is exposed on a steep hillside and apparently is up to 35 feet wide. A sample from the northerly end of the zone assayed 1.26% Cu, 7.52% Zn, 56.4% Pb and 26.8 oz./ton Ag.

Zones No. 10, 11, 12

A little stripping has been done on the Nos. 10 and 11 zones, but none has been done on the No. 12 zone. The extent of mineralization at these showings is thus not known at the present time. Bulldozer stripping and diamond drilling of these zones was recommended for the 1969 season. The locations of these three zones are approximately as follows:

Zone	Latitude	Longitude
10	61° 29'35"N	124° 49'15"W
11	61° 29'00"N	124° 49'20"W
12	61° 28'35"N	124° 49'25"W

The main work recommended for 1969 was further underground exploration between Zones 2 and 3 to test the potential and possibly outline reserves in the main north-striking shear zone and subsidiary veins striking N45° W. The latter veins have been found to have a higher silver content. Deeper drilling in the vicinity of Zones 2 and 3 was also recommended. In addition drilling on Zones 7, 8 and 9 was suggested to locate target areas for underground work. Dependent on the results of drilling on the No. 2 zone, an adit at a much lower elevation was recommended in this area.

Redstone Mines Ltd.
(95-L-10; about 62° 41'N, 126° 38'W) (Copper)

This property is located in the Redstone River area near Little Dal (Plateau) Lake. Copper occurs in a number of green-weathering siltstone and dolomitic siltstone beds in the top 150 feet of an otherwise uniform section of brilliant purple-weathering mudstone and siltstone about 1,000 feet thick (Green and Godwin, 1963, p. 39). The copper mineralization has been traced for about four miles and occurs chiefly in three persistent beds. Mineralization consists of chalcopyrite, bornite, chalcocite and pyrite, and is concentrated in the lower 1 1/2 feet of the middle bed and, especially, in the lower 4 1/2 feet of the bottom bed. The thickness of mineralization along the zone ranges up to about 8 feet. The range in thickness for the green calcareous beds is about 2 1/2 to 32 1/2 feet for the upper bed, 6 to 13 1/2 feet for the middle bed, and 6 to 25 feet for the lower bed (Baragar and Hornbrook, 1963, p. 37). The three beds are separated by two units of purple mudstone, each about 40 feet thick, which contain thin interbeds of buff dolomitic or limy siltstone.

The beds were sampled in 1962 for a total length of 19,000 feet. Of 19 sampled sections across the lower bed, four assayed about 6% Cu across a width of 6 feet and 10 assayed more than 2% Cu across the same width. The indicated grade for a length of 9,100 feet at the north end of the zone was 2.3% Cu across a width of 6.5 feet, while the grade was 3.74% Cu across 5.5 feet for a section 6,400 feet long at the south end of the zone. Only two samples from 14 sections across the middle bed assayed better than 1% Cu. Four sections across the southern part of the upper bed gave assays of better than 1% Cu, and the best assay was 5.27% Cu across a width of 9.5 feet.

In 1963 a total of 5,312 feet was drilled in 18 holes to test the zone. The best intersections obtained in this drilling were 1.67% Cu/52 ft., 2.10%/45 ft. (or 3.65% Cu and 0.49 oz./ton Ag across 10 ft.), 1.98%/25 ft., and 2.58%/20 ft. A total of 17,332 feet in 27 holes was drilled in 1964. Five of these holes gave good intersections, the best of which intersected 30 feet grading 3.2% Cu at a depth of 550 feet. This drilling indicated that for a length of 1,100 feet the average grade of copper was 2.5% for a thickness of 5 feet (Green, 1965, 1966; Baragar and Hornbrook, 1963; Boyle, 1968, p. 127).

The copper-bearing unit is overlain conformably by a sugary quartzite bed 20 feet thick, followed by about 600 feet of platy limestone. This in turn is overlain, apparently conformably, by green and purple-weathering conglomeratic mudstone and iron-formation of the Rapitan Group, which is probably Late Proterozoic in age (Green, 1965).

The copper-bearing sequence has been classified by Boyle (1968) as a shale deposit of the Kupferschiefer type. However, the character of the copper-bearing beds and associated sediments indicate close affinities to red-bed deposits.

In 1968 the company undertook a $30,000 program of geochemical and geophysical surveying in the vicinity of this zone of copper mineralization. In addition some mapping and sampling of showings containing silver-bearing tetrahedrite in the "Hidden Valley" area (Baragar and Hornbrook, 1963, p. 38) was carried out. The "Hidden Valley" area is located within claim sheet area 95-L-15, where claims MAC 1-18, DEAN 1-12, GEO 1-16 and STAN 1-10 are located. A crew of 14 men were employed in the

exploration program. The results of the surveys are not known to the author. The company was attempting to obtain financing for a deep-drilling program on the zone of bedded-copper mineralization.

Todd Explorations Ltd. (OK 19-85 and LM 1-18 claims)
(107-B-2, 7; about 68° 15'N, 133° 30'W)

This property is located about 8 to 10 miles southeast of Inuvik. In August 1967, the company was reported to hold 80 claims in 3 blocks in the area. An electrogeomagnetic survey was flown over the property by Klyceptor Surveys Ltd. Seven OK claims were added to the property in October 1967. Some lead mineralization has reportedly been found in a beaver dam on the stream that drains Todd Lake.

The property lies within an area of Middle Devonian limestone and shale of the Bear Rock and Hume Formations (Norris, Price and Mountjoy, 1963). These sediments, together with smaller areas of older Paleozoic rocks, represent the surface expression of a local high, the Campbell Uplift (Tassonyi, 1969), which is flanked to the east by Upper Devonian sediments, to the north by Cretaceous, Tertiary and Quaternary sediments, and to the west by the sediments of the modern Mackenzie Delta.

The reconnaissance airborne survey resulted in the location of three anomalous areas. A ground electromagnetic survey was recommended on the property. This survey was conducted using a Ronka EM radio-frequency instrument during the latter part of the 1967 season. Some data regarding this survey are as follows:

Area	Claims	Line spacing(ft.)	Line miles of survey
1	LM 1-18	400	10
2	OK 39-85	400	64
3	OK 19-38	150	18

A conductor was located in Area 2 just north of the creek that drains Todd Lake. Due to the proximity of the creek, this anomaly could be caused by conductive overburden. The next strongest anomaly enters the south end of Todd Lake and was considered to warrant further investigation.

Churn drilling of the electromagnetic anomalies on the property was recommended by A. R. Bullis at an estimated cost of $33,000. The company announced that this program would be carried out (The Northern Miner, Feb. 8, 1968, p. 7) and an overburden drill and 600-cubic-foot compressor were subsequently delivered to the property (Western Miner, Aug. 1968, p. 58). This drilling program was presumably undertaken before the close of the 1968 season but the results are not known to the author.

VICTORIA ISLAND

Muskox Mines Ltd. (Permit Areas 87-H-7, 9, 16, 78-B-4) (Copper)

Four permit areas on Victoria Island were granted to Ashmore Gold Mines prior to the 1968 season. The prospecting permits covered part of the

Natkusiak Formation which contains copper-bearing basalts similar to those of the Coppermine River area. Exploration of these permit areas, and of claims which were staked subsequently, was undertaken in 1968 by the Muskox Syndicate. The Muskox Syndicate was formed by Polaris Corp. (16.4%), V.N. Harbinson (6.4%), Marjad Ltd. (6.4%), PCE Explorations (5.9%), Hearne Coppermine Explorations (5.9%), Silvermaque Mining (5.9%), Cam Mines (5.9%), Spooner Mines and Oils (5.9%), Magnum Consolidated Mining (5.9%), Siscoe Mines (5.9%), T.C. Explorations (5.9%), Kodiak Petroleums (5.9%), Coltrin Investments (5.9%), Merland Oil Co. of Canada (5.9%), and James Operators Ltd. (5.9%). Muskox Mines Ltd. was formed subsequently as a successor to the syndicate. Each participant in the syndicate contributed $20,000 to form an exploration budget.

Reconnaissance prospecting of the permit areas and the VIC group was carried out in 1968 along widely spaced traverses and resulted in the discovery of showings of chalcocite, bornite and native copper. More than 100 copper showings were located during the season. A total of 1,828 claims were recorded on behalf of Muskox Mines, largely, if not entirely, during 1968. These claims were as follows:

Claim Sheet	Claims
77-G-13	VIC 1-321
87-H-8	HUK 1-50
87-H-10	MUK 1-364, MAK 1-324, MOX 1-324, KOX 1-265
87-H-15	MIK 1-180

The Natkusiak Formation consists of agglomerates and flows of basaltic composition and has a thickness of about 1,000 feet. Due to the resistance of the flows to erosion the exposed areas of volcanics and underlying sediments form topographic highs, as they did during deposition of surrounding Paleozoic sediments. The volcanics form a broad shallow trough known as the Holman Island Syncline. The axis of the syncline trends east-northeast to northeast across Victoria Island. Dips of the volcanics range from 3° northwest along the southeast side of the syncline to 14° southeast along the northwest side. The volcanics have been intruded by gabbro sills and by diabase and gabbro dykes. The prospecting permits cover most of the northern area of volcanics on Victoria Island (Thorsteinsson and Tozer, 1962).

Some native copper and chalcocite occur in amygdaloidal flow tops, in flow-top breccias, and as disseminations and fracture fillings in massive basalt. However, mineralized zones related to fault zones, generally mineralized fault breccias, were considered to be the most important type of showing.

Showing W5 is the most important zone of mineralization that was discovered. The mineralization occurs along a fault which strikes northwest and extends at least 40 miles across the Precambrian rocks, and possibly a farther 30 miles across the Paleozoics to the northwest. The showing is located at approximately 71° 52'N and 112° 43'W. Chalcocite, bornite, chalcopyrite and pyrite occur in fault breccia, as veins, and as disseminated replacement masses along the fault zone. Some narrow veins of massive sulphides occur in the country rock on either side of the fault, and some of the copper mineralization occurs in quartz-prehnite veins. The mineralized

Showing	Latitude	Longitude	Ag (oz./ton)	Cu(%)	Description
W 4	71° 45'	112° 36'	0.60	35.2	Talus, chalcocite, disseminated
			0.38	3.2	In quartz-prehnite vein material
M 125	71° 37'	113° 22'	0.25	1.44	Exposed. Chalcocite, chalcopyrite and pyrite disseminated in amygdaloidal basalt along a fault
M 129	71° 20'	113° 34'			Talus. Low grade. Chalcocite seams surround agglomerate(?) fragments, possibly replacement along a fault
M 130	71°19 1/2'	113° 36'			Talus. Same as M129
M 134	71° 28'	113° 38'			Exposed. Low grade. Malachite surrounds red agglomerate fragments.
M 142	71°48 1/2'	112° 32'	0.78	37.42	Talus. Chalcocite as massive veinlets and disseminated in quartz-prehnite veins
M 143	71° 48'	120° 30'	0.87	25.60	Talus. Massive chalcocite as veinlets, replacements, and in quartz-prehnite veins in a fault breccia or agglomerate
M 144	71° 44'	112° 40'			Talus. Narrow veins of massive chalcocite, possibly fault associated
M 148	71°52 1/2'	112° 59'			Exposed. Low grade. Disseminated native copper, bornite and malachite in fractured basalt and underlying sediments.
Z 52	71° 29'	113° 05'	0.98	9.81	Talus. Chalcocite in a rounded cobble of brecciated amygdaloidal basalt.
Z 88	71°26 1/2'	113° 44'	0.85	26.02	Talus. Chalcocite is veinlets, replacements and surrounding fragments of basalt in a fault breccia, and some seams in underlying sediments
K 17	71°56 1/2'	112° 07'			Talus. Massive chalcocite, possibly from a vein.

zone is evident mainly from fragments in talus which are distributed along a length of 1,000 feet. Blocks of nearly massive chalcocite up to 1 foot across are present along the zone. The assay results on six samples from the zone were as follows:

Cu(%)	Ag(oz./ton)
16.6	0.73
10.6	0.72
26.8	0.82
10.1	0.82
10.2	0.91
31.6	2.71

A number of other showings were found which were considered to be of the fault breccia-replacement type and of possible significance. These showings all contain semimassive or massive chalcocite, but all except three consisted only of talus fragments. Showings M142 and M143 are located about 6 1/2 miles southeast of showing W 5 and are probably related to the same major fault structure. The showings are listed in the table on page 142.

No significant copper showings were discovered on the VIC group of claims, nor on Permit Area 78-B-4. Showings W 5, M142, M143, M148 and K17 are located on Permit Area 87-H-16, showings W 4, M144 on Permit Area 87-H-9 near its north boundary, and showings M129, M130, M134, Z 52 and Z 88 on Permit Area 87-H-7.

At least a few survey lines were tried with a Ronka EM 16 electromagnetic unit across the W 5 showing. It was considered that the mineralized fault zones which are the main targets should be good conductors, and the testing of other geophysical methods was recommended. Recommendations for future work include detailed prospecting, general and detailed geological mapping, and reconnaissance geophysical surveys.

Grandroy Mines Ltd. (CHAS 1-36, ART 1-36, CAM 1-72 claims)
(87-H-10; about 71° 35'N, 113° 12'W) (Copper)

These claims form a block of 144 claims, although the company is reported to hold a block of 281 claims in the area (The Northern Miner, Sept. 19, 1968, p. 1). The claims are located on the most northerly area of rocks of the Natkusiak Formation on Victoria Island and are on or near the axis of the Holman Island Syncline. Reconnaissance prospecting of these claim groups was carried out during the 1968 season. Showings of native copper and chalcocite were located in the volcanics of the Natkusiak Formation.

The best showings that were located in place, including some spectacular showings of native copper, are concentrated within an area 1 mile wide by 2 miles long. Magnetometer and induced polarization surveys, and diamond drilling, were recommended for 1969.

Grandroy Mines Ltd. (50%) and others (EDEN 1-36, HO 1-144, OX 1-108, BOY 1-156, SI 1-252, SAN 217-396 claims) (Victoria Island) (Copper)

These claims, which total 876, are apparently all held by the same consortium of companies. The companies that have participated with Grandroy Mines in the exploration project are Captain Mines Ltd. (15%), First Orenada Mines Ltd. (15%), Satellite Metal Mines Ltd. (10%), and Combined Metal Mines Ltd. (10%). It was reported that these companies held 1,100 claims in the area (The Northern Miner, Sept. 19, 1968, p. 1). This report appears to assume that 400 SAN claims were recorded, which does not seem to have been the case. These claim groups are located as follows:

Claim group	Claim sheet	Latitude	Longitude
EDEN 1-36	87-H-8	71° 29'	112° 54'
HO 1-144	87-H-10	71° 33'	113° 05'
OX 1-108	87-H-10	71° 41'	113° 04'
BOY 1-156	87-G-1	71° 011/2'	116° 11'
SI 1-252	87-H-3	71° 07'	116° 35'
SAN 217-396	87-H-4	71° 02'	115° 28'

Prospecting was carried out on these claim groups during the 1968 season under the supervision of A. Ashton. The program was supported by a helicopter and by a Beaver aircraft equipped with large-sized wheels. The results of this work are not known in detail, but high-grade showings of native copper and chalcocite were discovered in volcanics of the Natkusiak Formation.

Magnetometer and induced polarization surveys were recommended as part of a further exploration program in the area.

KEEWATIN DISTRICT

Exploration in the Keewatin District from 1966 through 1968 was mainly a continuation of previous programs by Selco Explorations (Schiller, 1965, p. 59; Thorpe, 1966, p. 60) and Hudson Bay Exploration and Development (Thorpe, 1966, p. 62). Hudson Bay Exploration and Development continued reconnaissance exploration in the District, they devoted much of their attention to copper showings in porphyries of the Dubawnt Group. Selco Explorations continued investigation of gold prospects and their work included drilling of a property near Otter Lake and another near Maguse Lake.

A drilling program was conducted by Kennco Exploration on a copper property near Corbett Inlet. Several reconnaissance airborne gamma-ray spectrometer surveys were flown, largely over the Hurwitz Group.

Selco Explorations (Keewatin District)

The company continued to prospect and investigate gold showings at various locations in Keewatin District during the years 1966 through 1968. When the area was visited in 1967 the company had three prospecting parties

working in the vicinity of the north shore of Turquetil Lake. Two of these crews were located at 61° 58'N, 95° 57'W and 61° 55'N, 95° 59'W, both within claim sheet area 55-E-13, when the author visited them on August 18.

SCOTT 1-39, 42-50, 55-60 claims (65-H-4; about 61° 03'30"N, 97° 52'W)

A small drill program was carried out in 1967 on this property at Lothrop Lake, just south of Otter Lake, on a gold showing which had been investigated many years previously by Hudson Bay Mining and Smelting Company. Three holes had been drilled with a small machine to depths of 142, 146 and 82 feet at the time the property was visited on August 18. The showing, which was being tested by drilling, is located on an island at approximately 61° 03'30"N and 97° 50'15"W. The investigation of this property was assisted by the Federal Government through the Northern Mineral Exploration Assistance Program.

The 12-claim LOWO group was recorded in this area in 1949 by Kasba Explorations Ltd.

Selco Explorations Ltd. (ERIC 1-12 claims)
(55-E-11; about 61° 33'30"N, 95° 12'W) (Gold)

This property is just west of Maguse Lake. A gold showing was discovered here in 1966 while a prospecting program was being conducted in the area. The showing is at 61° 33'33"N and 95° 12'27"W and is a gold-bearing silicified zone in metamorphosed volcanic rocks. Some preliminary geochemical sampling was done in 1966. In 1967 the showing was tested by 3 pits and by 6 drillholes totalling about 500 feet. These holes were drilled at 30-foot intervals with a packsack diamond drill. The results of this work were encouraging. Some additional geochemical samples were also taken near the showing. Prior to the 1968 season a Prospecting Permit was acquired surrounding the ERIC claims.

In 1968 the showing was investigated by a magnetometer survey, a geochemical survey, detailed geological mapping and by diamond drilling. Mapping at a scale of 200 feet to the inch was done on a grid about 6,000 by 6,000 feet that included the showing. Geological mapping of the Permit Area, 55-E-11, was apparently done at a scale of 1/2 mile to the inch.

The magnetometer survey resulted in an anomaly over 300 feet long that corresponded with the mineralized zone. The diamond-drilling program consisted of a total of 4,000 feet in 12 holes that were drilled on section lines at 100-foot intervals along the zone.

The mineralized zone strikes about N5° W to due north and dips 70° to 80° west. The zone is located at the footwall of a unit of amphibolite near its contact with a sequence of rhyolitic tuffs, and is invariably underlain by a band of rhyolite tuffs about 5 feet thick. The mineralized zone consists of a sulphide-bearing silicified zone that is 5 to 50 feet wide. The sulphide mineralization is predominantly pyrrhotite, with minor amounts of associated chalcopyrite and sphalerite. The zone widens down the plunge to the southwest and the sulphide content increases, but the grade of gold mineralization decreases.

Assay values of 1.8 oz./ton Au across a width of 11.5 feet and 0.71 oz./ton across a width of 5 feet were reportedly obtained from the zone. The gold values are apparently distributed erratically along the zone, sometimes concentrated near the hanging-wall and sometimes near the footwall. The drilling done in 1968 failed to give intersections of comparable grade to those obtained in the 1967 program. The best assay result was 1.00 oz./ton Au across 1.5 feet (Hole 68-6) and the best intersection graded 0.51 oz./ton Au across an estimated true width of 7.5 feet (Hole 68-3). The drill program tested the zone for a length of 600 feet and to a depth of 225 feet.

The drillholes intersected massive white quartz which proved to be barren, and granular grey quartz which contains the gold values. The mineralized zone contains minor sulphides and some biotite. Some visible gold was noted in the grey quartz and appears to be associated to some extent with streaks of chlorite and of country rock.

The preliminary geochemical investigations in 1966 and 1967 indicated that the distribution of copper and zinc in soils might be used as a guide in tracing mineralization. However, results of the 1968 survey were somewhat inconclusive. This survey was restricted to samples from the organic layer. It was planned to analyze the samples for metals other than copper and zinc.

Permit Area 55-E-11

The amount of rock exposure within this area is very low. The area is underlain by metavolcanics (amphibolite) of Archean age, with interbedded iron-formation and greywacke, granitic gneiss, and metasediments that are probably of Early Proterozoic age.

No significant gold or base metal showings were found on the permit area. However, a large shear zone which crosses Maguse River just north of Maguse Lake (possibly 61° 49'N, 95° 27'W) was investigated and yielded a sample which gave a good gold assay. Somewhere northwest of this and to the south of Carr Lake a molybdenite showing was investigated.

Selco Explorations Ltd. (REP 1-12 claims)
(55-K-4; about 62° 08'N, 93° 50'W) (Gold)

A gold showing has been known at this location for some years. Trenching was being done on the property by a crew working for Selco Exploration when the property was visited on August 4, 1966. Attention was being devoted to quartz veins which have been introduced along shears in pillowed andesitic volcanics.

The lavas strike N65° E to N75° E and the dips are vertical to steep to the south. The flows appear to face to the north. The principal shears in the volcanics strike northeast-southwest to east-west and are vertical. The shears vary along strike from a few feet to as much as 10 feet in width. The quartz ranges in colour from white to nearly black. It was reported that where sulphides (often chalcopyrite) are present in the quartz, good gold assays are generally obtained.

A shear zone near the shore of the lake is 15 to 20 feet wide and dragfolding of the sheared rock in the zone indicates that the north block moved to the west. On some northwest-southeast cross shears there are left-hand displacements of the east-west shears.

Work up to the time of the author's visit indicated that gold was present in a number of shear zones, some containing quartz veins and some without. Much additional trenching was required, as of that date, to prove whether or not the better grade sections have any strike continuity.

Kennco Explorations (Canada) Ltd. (WP 1-12 and BETH 1-6 claims) (55-K-10; about 62° 38'N, 92° 50'W) (Copper)

Staking of this property by R. Puls was prompted by the discovery of some high-grade copper-bearing float. The property was subsequently optioned by Kennco Explorations. During the 1965 season some airborne, and a limited amount of ground, geophysical work was done by the company. Early in the 1966 season a total of about 2,100 feet of drilling in 5 holes was done to test an anomaly.

The core was examined when a visit was made to the property on August 4, 1966. The country rock consists of slightly sheared basic metavolcanics interlayered with more highly siliceous rock. This more silica-rich rock is a biotitic grey gneiss which may represent metamorphosed trachyte or dacite flows. Only very minor pyrrhotite-chalcopyrite mineralization is evident in the core. The pyrrhotite and chalcopyrite occur scattered through the rock, as fine sulphide stringers and in veinlets of quartz up to a few inches in width.

Hudson Bay Exploration and Development Co. Ltd. (Dubawnt Lake-Baker Lake area) (Copper)

During the 1966 season the company conducted an aircraft and helicopter-supported exploration program in the Dubawnt Lake-Baker Lake area. One of the main exploration targets of the season was copper mineralization within the Dubawnt Porphyry. However, the main objective of the program was to carry out reconnaissance exploration of an extensive area.

TUL 9-15, 26-36 claims (65-O-3; about 63° 10'45"N, 99° 22'W)

Some of the copper showings in the Dubawnt Porphyry were visited just west of Kunwak River where it flows out of Tulemalu Lake. Narrow veinlets of chalcocite or chalcocite and bornite are present along fractures and minor shears in the porphyry. There is generally very minor gangue in the veinlets, although epidote is present in places. The mineralization is similar in many respects to that in the basalts of the Coppermine River Group in the Coppermine area.

In 1967 the company continued reconnaissance exploration in the Baker Lake area. However, it appears that little of interest was found. Some induced polarization surveying was done on a few copper showings in the porphyries of the Dubawnt Group. The induced polarization crew were leaving via Baker Lake when the settlement was visited on August 17.

TEB 1-18 claims (65-O-9; about 63° 34'45"N, 97° 28'15"W)

These claims are located about 8 miles southeast of Tebesjuak Lake. The property was investigated by Hudson Bay Exploration and Development in 1966 and 1967.

The claims are underlain by porphyries of the Dubawnt Group similar to those on the TUL group. Some chalcocite showings, presumably as veins along fractures and shears in the porphyries, were investigated on the property. Some galena-bearing showings are also covered by the claim group.

KAZ 1-12 claims (65-P-10; about 63° 41'30"N, 96° 53'05"W)

These claims are located just north of the west end of Thirty Mile Lake and about 50 miles southwest of the settlement of Baker Lake. The property, as with the claim groups described above, is underlain by porphyries of the Dubawnt Group (Wright, 1967). These rocks are probably extrusive in origin.

The claims were staked to cover copper showings which consist of stringers and blebs of chalcocite in a series of quartz veins. These showings are located on claims KAZ 7 and 8. Trenching was done on a showing on KAZ 8.

During the period July 30 to August 2, 1967, a Ronka EM 16 electromagnetic survey was done over a grid about 3,000 feet by 3,000 feet which covered claim KAZ 8 and parts of claims KAZ 5-7, 9 and 11. This survey covered 9.1 line miles and located 8 anomalous zones. Horizontal loop electromagnetic and induced polarization surveys were run to test these anomalies but gave negative results.

THI 1-4 claims (65-P-10; about 63° 38'05"N, 96° 41'25"W)

This group of claims is located just north of Thirty Mile Lake and about 7 miles southeast of the KAZ group. The property is apparently underlain by syenite, feldspar porphyry and andesitic to basaltic volcanics.

The claims cover stringers of galena, chalcopyrite and pyrite in shear zones. Some silver values are associated with the sulphide mineralization. The showings are on and near the boundary between claims THI 1 and 2 and were investigated by trenching, possibly in 1966.

In August 1967, a Ronka EM 16 electromagnetic survey was conducted over a large part of the claims and an equal area immediately to the east. The survey grid covered a total of 14.4 line miles. The survey showed 32 anomalies, generally very weak but including one moderate anomaly on claim THI 3. The anomalies were further tested by a horizontal-loop electromagnetic survey which totalled 5.6 line miles. No anomalous responses were obtained in this survey.

In 1968 a small drilling program may have been carried out on this property.

NOW 1-12 claims (65-K-10; about 62° 32'N, 100° 48'W)

This group of claims is located about 8 miles north of the East Arm of Nowleye Lake. The claims cover a chalcocite showing in porphyries of the Dubawnt Group. The showing has been investigated by three trenches on claim NOW 8.

In the period July 20-August 14, 1967, geophysical surveys were carried out on claim NOW 8 and parts of claims NOW 5, 7, 11 and 12. A Ronka EM 16 electromagnetic survey covered 9.8 line miles along east-west lines spaced at 200-foot intervals. The survey disclosed 7 anomalous zones, one of which corresponded to the chalcocite showing. A horizontal loop electromagnetic survey covered 5.4 line miles and tested the anomalous zones. No anomalies were obtained with this survey method. An induced polarization survey was recommended to further explore the property.

Aurora Syndicate (Rankin Inlet-Baker Lake-Watterson Lake)

This organization did an independent (see Spectroair Explorations) investigation of the uranium possibilities of the Hurwitz sediments in southern Keewatin District in 1967. Reconnaissance airborne scintillometer investigations, principally of the quartzite belts, were followed up by ground scintillometer work and prospecting by three crews. One crew was camped on Montgomery Lake and another at Padlei when the area was visited August 17-18. Some pyritic conglomerate with fair radioactivity was located as boulders at Montgomery Lake. In the vicinity of Padlei the conglomerate that had been located had a low pebble to matrix ratio and was only about twice background in radioactivity.

In this program the Hurwitz sediments on Marble Island near Rankin Inlet, in the vicinity of Tavani, in a belt from Quartzite Lake to Carr Lake, and in the general Padlei to Watterson Lake area were investigated. These sedimentary areas are shown by Wright (1967). In addition sedimentary belts north of Baker Lake in the vicinity of Whitehills Lake and Schultz Lake, and at about 65° 30'N and extending from 94° 15'W to 99° W, were also investigated by airborne reconnaissance and some checking on the ground.

Yellowknife Bear Mines holds a 25 per cent interest in the Aurora Syndicate.

Spectroair Explorations Ltd. -Cominco Ltd.
(Tavani-Watterson Lake-Baker Lake)

Spectroair Ltd. is a company which was formed by Madrona Explorations Co. Ltd., Croydon Mines Ltd., New Cronin Babine Mines Ltd., and Silver Ridge Mining Co. Ltd. In 1967 Spectroair and Cominco entered into an agreement to carry out a joint exploration program in Keewatin District. The survey was flown, at first, with a Helio-Courier airplane and gamma-ray spectrometer equipment which had been thoroughly tested in surveys flown by Spectroair in 1966 in the East Arm area, Great Slave Lake. The Helio Courier plane was wrecked in a crash during the summer and the program was delayed for some time until a Beaver aircraft became available for the work.

In this program some flying was done out of Baker Lake and some from Cullaton Lake. It is believed that attention was concentrated on the sediments of the Hurwitz Group.

Trigg, Woollett and Associates
(Watterson Lake to Padlei, Snowbird Lake)

This consulting organization conducted an airborne spectrometer investigation in 1968 of the sediments in the Watterson Lake basin (65-G-3), and of similar sediments extending north-northeast to Padlei (65-H-15). The belt of sedimentary rocks extending north-south through Snowbird Lake (65-D) were also investigated from the border between Saskatchewan and the Northwest Territories to about 61° 20'N. The work was done for an unidentified client.

The program was supported by a prospector and a geologist. The best radioactivity that was detected was at a location just west of Padlei.

PRODUCING AND DEVELOPING MINES

Pine Point Mines

The general geology of the Pine Point area has been described by Norris (1965). Summaries of developments at the property have been given by Schiller (1965) and Thorpe (1966). In 1965 the mine had a total of 26 known orebodies, 12 of which had been located by the drilling of 23 induced polarization anomalies. The individual orebodies range from less than 100,000 tons to over 3,000,000 tons.

To the end of 1965 a total of 73,356 tons of ore were milled after the mill started operating in November. The milling rate by May 1966, was at about 4,000 tons per day. This rate of milling was below the crushing-grinding capacity of the mill but the flotation circuits were operating at or near capacity. In addition to shipment of concentrates to Trail, B.C., Idaho and Japan, it was announced that 10,000 tons of zinc concentrates per year were to be shipped to Anaconda American Brass Ltd., Montana. In 1965 a total of 364,168 tons of crude ore with an average grade of 22.5% Pb and 29.1% Zn were shipped by the mine.

Production by the mine for the years 1966, 1967 and 1968 are given in the table on page 151.

In 1966 net earnings by Pine Point Mines were $37,030,000 from sales of $42,636,000 and a net profit of $34,196,000 was recorded for the year. The sales revenue was derived approximately 48 per cent from sale of direct-shipping ore, 19 per cent from lead concentrate and 33 per cent from zinc concentrate. Dividends totalled $24,840,000 and a surplus of $9,354,000 was held. The balance of debt, $7,166,400, was paid off by the company during the year. In mid-1966 526,400 shares of the company were issued to Pyramid Mining Company for the two deposits that had been discovered by Pyramid in 1965.

During 1966 approximately 51 per cent of the sales of concentrates were made in Canada, chiefly to Cominco Ltd., 31 per cent were made in the United States, chiefly to Anaconda company, and 4 per cent were made in Europe. In December 1966, it was reported that an initial shipment of 10,000 tons of zinc concentrate had been made to Cominco Binani Zinc Ltd., India. The high-grade ore shipped without milling during the year averaged 18.8% Pb and 26.3% Zn. Overburden and waste rock stripped in the open-pit mining operations amounted to 1,494,987 tons during the year. Three pits were in

Year and quarter	Crude ore shipped	Tons milled	Milling rate (t. p. d.)	Total production lb. Pb	Total production lb. Zn	Overall grade Pb(%)	Overall grade Zn(%)
1966 (1)	57,472	308,480	3415	58,545,000	95,026,360	8.0	13.0
1966 (2)	86,757	399,944	4400	69,148,635	125,417,324	7.1	12.9
1966 (3)	77,971	373,919	4060	64,083,000	117,243,260	7.1	13.0
1966 (4)	59,915	375,647	4075	53,274,594	114,894,006	6.1	13.2
Year	282,115	1,457,990		245,051,229	452,580,950		
1967 (1)	65,775	358,201	3980	48,654,420	109,890,380	5.7	13.0
1967 (2)	84,858	419,940	4610	70,319,480	133,094,660	7.0	13.2
1967 (3)	99,132	328,083	3566	67,709,690	113,259,360	7.9	13.2
1967 (4)	83,130	415,055	4511	71,073,840	113,815,240	7.1	11.4
Year	382,355	1,521,279		257,757,430	470,059,640		
1968 (1)	82,427	485,837	5340	65,423,930	105,219,000	5.75	9.3
1968 (2)	102,755	474,592	5210	69,805,996	118,801,560	6.0	10.3
1968 (3)	92,056	554,534	6020	72,913,060	124,152,340	5.6	9.7
1968 (4)	72,421	554,440	6020	57,111,294	104,211,680	4.5	8.3
	349,659	2,069,403		265,254,280	452,384,580		

production at year end. Ore reserves at the end of 1966 were reported to be 37,800,000 tons averaging 2.9% Pb and 6.8% Zn, including about 11,000,000 tons purchased from Pyramid Mining Company (The Northern Miner, Mar. 30, 1967, p. 13). As of the end of the year 60 per cent of the claims held by Pine Point Mines, which totalled about 2,306 claims, had been covered by induced polarization surveys.

During the first quarter of 1967 Pine Point Mines milled 358,201 tons of ore with an average grade of 4.2% Pb and 10.4% Zn, and shipped 65,775 tons of crude ore containing about 17.1% Pb and 29.9% Zn to Kimberley, B. C. (Can. Mining J., June 1967). At this milling rate of nearly 4,000 tons per day the gross value of production for the mine was about $10 million per month.

In the late spring of 1967 Pine Point Mines was proceeding with a 3,000 tons per day addition to the concentrator and mining plant. This addition was to increase the mill capacity to 8,000 tons per day in order to handle production from the Pyramid property. On the latter property further investigation of reserves, study of possible water problems, road construction, and other preparations were being carried out. Total expenditure to bring the Pyramid deposits into production had been estimated at $16 million. The production of concentrates from this property was anticipated early in 1969 (Eng. Mining, June 1967, p. 294).

Some difficulties in marketing concentrates, particularly zinc, were being encountered early in 1967. The mill was shut down for a three-week vacation period in July for this reason.

By the end of August the old pits, on orebodies O-42 and N-42, were nearing the water-table with a single bench of ore remaining in one and two benches in the other. A large part of the production was then from the N-32 orebody, a large deposit near the airstrip. A fourth orebody, J-44, just north of the railroad had been stripped and was ready for production. Preparations for production from the Pyramid deposits were going ahead rapidly. Holes had been drilled and pumps were in operation to test the water problem.

In 1967 the grade of ore was down slightly but the tonnages of both direct shipping and milling ore were higher. The direct shipping of crude ore was expected to continue throughout 1968. During the year 3.4 million tons of waste and overburden were removed, with 1.4 million tons of this coming from the Pyramid deposit. A new fleet of trucks was placed in operation during the summer of 1967. Ore was produced from 3 pits and the stripping of overburden was done from 4 additional pits.

Net profits by Pine Point Mines during the first half of 1967 were $17,800,000. Direct-shipping ore produced during the year was reported (The Northern Miner, Mar. 28, 1968, p. 13) to be 333,000 tons averaging 18.0% and 27.9% Zn. This high-grade ore accounted for 42 per cent of the total sales revenue for the year. Prices of lead and zinc were lower during the year but sales were higher to offset this. The known reserves of high-grade ore as of the end of the year were reported to be 475,000 tons. The total ore reserves were reported to be 40,500,000 tons grading 2.6% Pb and 6.8% Zn.

Exploration diamond drilling during 1967 tested some of the induced polarization anomalies located in 1966. This drilling was reported to have given favourable results. The company spent $4,503,000 during the year on expansion of mining and milling facilities required to bring the Pyramid deposits into production.

During the first quarter of 1968 production included the shipping of 86,020 tons of crude ore grading 21.1% Pb and 26.0% Zn to Kimberley, B.C. Earnings for the quarter were $8,275,000 compared with $9,319,000 for the first quarter of 1967. The 3-year tax-exempt period for the mine ended March 1, 1968. By mid-March 2, 200,000 tons of overburden had been stripped from the Pyramid No. 1 deposit. A further 5 million tons of overburden and 2 million tons of waste rock remained to be stripped from the deposit during the year.

For the first half of 1968 the net profits were $13,191,000 from sales of $20,632,000. Provision was made for income tax and Northwest Territories royalty in the amount of $1,900,000. Direct-shipping ore during the period was 192,453 tons averaging 18.8% Pb and 25.7% Zn.

During 1968 the net profits of the company were $21,029,000 from sales of $38,913,000, compared with $34,232,000 from sales of $42,701,000 in 1967. Income taxes amounting to $7,100,000 were paid in 1968. Direct-shipping ore accounted for 47 per cent of sales, lead concentrates for 22 per cent, and zinc concentrates for 31 per cent.

Reserves of direct-shipping ore were exhausted in mid-December, 1968. However, the start of production from the Pyramid deposits was expected to keep lead and zinc production by the company at approximately the same level. A total of about 350,000 tons of crude ore were shipped during the year. Reserves of milling ore were reported to be 39,300,000 tons averaging 2.6% Pb and 6.8% Zn as of December 31, 1968. Production from the main Pyramid deposit and operation of the 3,000 tons per day mill addition apparently started on January 9, 1969.

Pyramid Mining Company

This company was one of the first to initiate exploration in the Pine Point area in 1965, thus starting a staking rush and intensive exploration which continued throughout 1966. Induced polarization surveys and diamond drilling resulted in the discovery of two ore deposits (Thorpe, 1966, p. 33).

The No. 1 deposit is located on claims RH 45, 46, 47, 49 and AD 100, 101 at approximately 60° 53'00"N and 114° 12'15"W. The deposit was investigated by drilling vertical holes at 200-foot intervals on a grid pattern. The ore outline was found to agree quite closely with the outline of the induced polarization anomaly. The deposit is about 2,600 feet long by 1,000 to 1,200 feet wide. Overburden over the deposit is 30 feet or less thick in many places, although it does reach 50 feet or more at some locations. Ore thickness for much of the area of the deposit is 70 to 100 feet.

On the basis of assay data for 62 holes (out of perhaps 80 holes drilled with numbers ranging from 1 to 91) and estimated grades for holes 92 to 105 the proven tonnage for the No. 1 deposit was calculated as 8,742,575 tons grading 2.74% Pb and 9.10% Zn, or 9,616,833 tons grading 2.50% Pb and 8.30% Zn when allowance was made for 10 per cent dilution.

The No. 2 deposit is located on claim RH 30 at approximately 60° 52'25"N and 114° 14'05"W. The induced polarization anomaly representing this deposit was about 400 feet long by 200 feet wide. This deposit is apparently about 700 feet long by 350 feet wide with an approximate ore thickness of 150 feet. The amount of ore proven in the deposit by the spring of 1966

was reported (Western Miner, Apr. 1966, p. 187) to be 1,408,275 tons grading 2.46% Pb and 6.71% Zn, or 1,549,103 tons grading 2.30% Pb and 6.20% Zn with allowance for 10 per cent dilution.

Diamond drilling on the two deposits was carried on at a rapid pace using four drilling machines during the winter of 1965-1966. To the end of March 1966 a total of 26,833 feet had been drilled in 139 holes on the property. This drilling program resulted in the proving of about 11,166,000 tons grading about 2.5% Pb and 8.0% Zn. In late March or April 1966, the property was sold to Pine Point Mines for 526,400 shares of the latter company, representing a purchase price of about $33,000,000 or $3 per ton of proven ore at the current share value. Issuing of the shares to the Pyramid shareholders was delayed while a ruling was awaited as to whether tax would be payable on the sale. The company was eventually informed that tax would not be payable (The Northern Miner, Nov. 30, 1967, p. 99).

Induced polarization surveying was continued during the early months of 1966. By the end of May 1966, the main Pyramid property had been completely covered by induced polarization surveys, with the exception of the most southwesterly tip. No other significant anomalies were located.

Giant Yellowknife Mines

The general geology of the mine has been summarized by Boyle (1961) and Baragar (1961). Some of the mine developments in 1964 and 1965 were summarized by Schiller (1965) and Thorpe (1966). The Giant mine is the second largest gold producer in Canada.

During 1966 drilling for development planning and exploration purposes was continued. Small amounts of new ore were outlined adjacent to the operating working places, but this was insufficient to replace the ore mined during the year. The main ore-bearing zones had been largely delimited on the main Giant Yellowknife property, with the deepest known ore at a depth of 1,650 feet.

Ore milled from the main Giant property in 1966 amounted to 384,271 tons with an average mill-head grade of 0.652 oz./ton gold. Recovered from this ore were 225,228 ounces of gold, and 20,924 ounces of silver, for a gold recovery of about 89.9 per cent. The operating costs per ton of ore milled were approximately $13.51 in comparison with $12.88 in 1965. To the end of 1966 the orebodies of the Giant mine had provided approximately 5,400,000 tons of ore averaging 0.75 ounce of gold per ton.

In 1967 ore milled from the main Giant property was reported to be 312,711 tons which resulted in a production of 186,469 ounces of gold (The Northern Miner, Apr. 4, 1968, p. 3). From 1961 through at least 1967 the mine operated without Emergency Gold Mining Assistance. During the year 275,000 tons of ore were removed from reserves as a result of upward revision of the cut-off grade to 0.46 oz./ton gold. The milling rate declined to a low point in August 1967 (540 tons per day) from the normal rate of just over 1,000 tons per day. This decline was due to the scarcity of experienced mine labour. The rate of production was restored to normal in 1968. The ore produced in 1967 was derived from widely separated areas in the mine, and from more small irregular stopes and less of the large high-grade stopes. Exploratory diamond drilling was continued but no new ore zones were located. Reserves at the mine at the end of 1967 and in the previous and subsequent years are listed in the table following.

Year end	Reserves (tons)	Grade (oz./ton)
1965	2,370,000	0.70
1966	2,134,000	0.68
1967	1,628,500	0.71
1968	1,275,450	0.73

The reserves at the end of 1967, inclusive of the Lolor and Supercrest properties, were 2,045,300 tons grading 0.699 oz./ton gold. The net income of the mine in 1967 was $1,426,551 compared with $2,099,825 in the previous year. For the first 6 months of 1968 the consolidated net income was $1,131,796, up somewhat from $1,010,107 for the same period of 1967.

Gold production by Giant Yellowknife Mines, including that from the Lolor and Supercrest properties is listed in the table below. Silver produced in 1966, 1967 and 1968 amounted to 21,041, 23,102 and 24,267 ounces, respectively.

From the start of production in 1949 to the end of 1968 the value of metal produced was $138,341,591. This production was derived from the treatment of 6,102,221 tons of ore. During this period a total of $34,541,675 was paid out in dividends.

Year	Quarter	Total employees	Tons milled	Rate t.p.d.	Recovered grade (oz./ton)	Ounces Au produced
1966	1	355	97,022	1078	0.584	56,605
	2	364	95,194	1047	0.624	59,411
	3	375	94,181	1023	0.584	54,955
	4	365	100,403	1091	0.555	55,725
	Year		386,800		0.586	226,696
1967	1	364	101,315	1126	0.568	57,533
	2	344	89,332	982	0.642	57,415
	3	364	61,525	670	0.613	37,708
	4	361	79,751	867	0.555	44,320
	Year		331,925		0.593	196,976
1968	1	367	90,936	997	0.591	53,778
	2	399	94,205	1035	0.610	57,468
	3	391	96,054	1044	0.525	50,429
	4	388	93,522	1014	0.520	48,677
	Year		374,717		0.559	210,352

Lolor Mines and Supercrest Mines

During 1966 production from the Lolor property was 1,591 tons and 938 tons were produced from the Supercrest property, all from development work. The average grade for the ore mined was 0.45 oz. for Lolor and 0.85 oz. for Supercrest. Giant Yellowknife Mines holds an 87 1/2 per cent interest in Lolor Mines. Lateral development in 1966 on the Supercrest (Akaitcho) property on the 575-foot and 750-foot levels totalled 1,636 feet (Annual Report of Giant Yellowknife Mines). Raising totalled 732 feet including a break-through to the old Akaitcho shaft. The ore outlined by drilling in the steeper part of the Akaitcho zone immediately above the 750-foot level

was estimated at 59,000 tons averaging 0.65 oz./ton Au. One stope was placed in operation on the Lolor property on May 1, 1967, and one on the Supercrest property in June of the same year.

Supercrest Mines is owned 50 per cent by Akaitcho Yellowknife Gold Mines and 50 per cent by Giant Yellowknife Mines. In addition Giant has a 7.8 per cent interest in Akaitcho, while Falconbridge Nickel Mines holds a 36.7 per cent interest in Akaitcho and provides the management (The Northern Miner, Dec. 14, 1967, p. 15).

Production plans for the Supercrest (Akaitcho) property were delayed during the summer of 1967 due to difficulties in obtaining experienced miners, but the mine entered the production stage as of October 1, 1967 (The Northern Miner, Jul. 4, 1968, p. 13). The property was not granted new-mine status for tax purposes, but qualified for assistance under the Emergency Gold Mining Assistance Act. Giant Yellowknife Mines expended $671,061 from 1965 to the end of 1967 in bringing the property into production. Ore from the property is hoisted through the Giant shaft, although the Akaitcho shaft is used to some extent for access and the lowering of supplies.

During 1967 development work on the Supercrest property was directed toward readying four stopes on the 750-foot level for production. This level was extended some distance to the north and drifting was also done on the 575- and 425-foot levels. Work totalled 2,328 feet of drifting and cross-cutting, 613 feet of raising, and 27,535 feet of drilling.

Drilling between the 425-foot and 750-foot levels blocked out 51,000 additional tons of ore, bringing reserves here to 99,300 tons grading 0.65 oz./ton gold. Between the 1,100-foot and 750-foot levels drilling indicated 137,000 tons of ore grading 0.72 oz./ton in two ore shoots. No drilling was done during the year above the 425-foot level where 100,000 tons of indicated ore grading 0.68 oz./ton gold are reported. Development of the flat No. 1 orebody here was started during the year. The cut-off grades used for ore reserve calculations were raised as a consequence of increased costs for labour and material.

Surface exploration in 1967 located what is believed to be the faulted extension of the Akaitcho zone to the north of the Akaitcho fault (The Northern Miner, Jul. 4, 1968, p. 13). Ten holes were drilled north of the fault and some gold-bearing intersections were obtained at depths of 200 to 700 feet. One hole gave an intersection of 3.05 oz./ton Au for a core length of 5 feet, but the other holes gave sub-ore values.

It was planned to increase production from the Supercrest property to 200 tons per day by late 1967, if possible. From the start of production to the end of 1967, 4,588 tons were milled with a recovery of 2,690 ounces gold and 260 ounces silver. In 1966 development ore amounting to 938 tons from this property were milled and resulted in a recovery of 676 ounces of gold and 59 ounces of silver. In 1967 development ore totalling 31,257 tons from the Lolor and Supercrest properties yielded 17,119 ounces of gold. It appears that production for the Supercrest property in the last quarter of 1967, when it was formally in production, amounted to 6,555 ounces of gold from 11,047 tons of ore (The Northern Miner, Apr. 4, 1968, p. 3). The similar figures for the Lolor property were 3,955 ounces of gold from 8,164 tons of ore. Production from Supercrest in 1968 was 18,208 ounces of gold from the milling of 28,743 tons of ore. Reserves at the end of 1968 for the Supercrest mine, presumably in the most-developed section between the 425-foot and 750-foot levels, were reported to be 81,400 tons averaging 0.76 oz./ton gold.

Reserves for the Supercrest property as indicated by surface drilling to the end of 1968 were reported (The Northern Miner, Feb. 22, 1968, p. 15) to be 260,000 tons averaging 0.48 oz./ton Au. Underground development confirmed an additional 59,000 tons between the 750-foot and 575-foot levels which graded 0.65 oz./ton. Drilling below the 750-foot level was reported to have traced the gold zone for a length of 700 feet and to have indicated that the zone bottoms out at about 180 feet below the 750-foot level.

For the first 9 months of 1968 it was estimated that $142,000 would be received as Emergency Gold Mining Assistance for Supercrest Mines and $75,000 for Lolor Mines.

On the Lolor property lateral development in 1967 consisted of an advance of 395 feet on the 425-foot level. Diamond drilling during the year failed to add any ore to the reserves. It was expected that the mining of ore shoots on the property would be relatively simple, and that for several years the property would provide one of the more important sources of ore.

In 1968, 18,768 tons were milled from the Lolor property with a recovery of 10,170 ounces of gold. Development ore mined from the property in 1966 amounted to 1,591 tons grading 0.454 oz./ton Au, and 792 ounces of gold and 58 ounces of silver were produced. Ore reserve estimates for the Lolor Mines property are as follows:

Year end	Tons	Grade (oz./ton)
1965	236,000	0.72
1966	324,000	0.65
1967	317,500	0.67
1968	331,400	0.71

Northbelt Yellowknife Mines

This company holds 117 claims, including the former Crestaurum property, which lie north of the main property of Giant Yellowknife Mines. As of early 1967 Falconbridge Nickel Mines held 747,582 shares, Transcontinental Resources held 297,582 shares, and 284,000 vendor shares were held by Giant Yellowknife Mines. To the end of 1967 Giant had spent $87,527 in exploration on the Northbelt property, for which it was to receive 350,109 Northbelt shares. It was reported that as of December 31, 1968, Falconbridge held a 38.7 per cent interest, Transcontinental Resources 15.4 per cent and Giant Yellowknife 45.8 per cent.

Geological mapping, including compilation of data from old records, was continued during 1967. Some diamond drilling was also done on the property. It was reported that some progress had been made in projecting the schist zone system onto the property from known locations to the south.

During 1968 a total of 5,563 feet of surface diamond drilling was done on the property. One hole was located near the south boundary of claim ED 9 and was drilled to a depth of 347 feet at a 45° inclination without intersecting a schist zone. A narrow schist zone was intersected in a hole drilled near the southeast corner of claim MB 10.

Further work was planned on the property in 1969. Giant Yellowknife Mines, through further exploration expenditures to a total of $420,000 prior to December 31, 1970, can increase its interest in Northbelt to 60.9 per cent.

Con, Rycon and Vol Mines

The Con-Rycon Mine is located at Yellowknife and is the oldest operating gold mine in the Northwest Territories. The mine production in 1965 was divided between the Con, Rycon and Vol properties in the approximate proportions 59.6, 36.0 and 4.4 per cent (Thorpe, 1966).

Details of the geology of the mine and vicinity have been given by Boyle (1961) and by Baragar and Hornbrook (1963). The mine developments during 1965 have been summarized by Thorpe (1966). The production in 1965 was derived from the Campbell shear system. The bottom level of the mine at the end of 1965 was at the 4,300-foot level. About 1,500 feet of drifting in the hanging-wall was completed on this level in 1965. However, the drift was located well into the hanging-wall and nothing was known regarding mineralization in the Campbell shear at this depth.

Early in 1966 drilling from the hanging-wall drift on the 4,300-foot level was started to test the Campbell shear. Shaft sinking was also started to give three more levels at depths of 4,500, 4,700 and 4,900 feet.

By the end of the year sinking had been completed to the station for the 4,900-foot level. Production and development work during the year was carried out as follows:

100 Zone

During the year a drift on the 3,300-foot level was extended 300 feet to the north to permit exploratory diamond drilling above and below the level.

101 Zone

This zone is located in the hanging-wall of the Campbell shear system to the south of the winze. During 1966 ore production was concentrated between the 4,100- and 3,100-foot levels. Stope preparation was in progress on the 3,700-, 3,900- and 4,100-foot levels.

A considerable amount of development work along the 101 Zone was undertaken to permit extensive diamond drill exploration of the zone. A drift was extended 600 feet to the south in the hanging-wall of the zone on the 4,300-foot level. Drilling from this drift to test the zone below the level was in progress. A program of driving crosscuts into the footwall was started on the 4,100-foot level to permit drilling of the zone above the level. A hanging-wall drift was driven to make it possible to test the zone above the level. A similar program of crosscuts was undertaken on the 3,900-foot level to permit drilling of the zone above the level. A hanging-wall drift on the 3,500-foot level was driven for purposes of drill testing the 101 Zone below the level.

On the 3,700-foot level a drift was extended 200 feet to the south in the shear zone. This drift encountered several narrow lenses of marginal grade.

102 Zone

Some production was continued during the year from between the 3,300- and 2,900-foot levels.

103 Zone

This zone is located to the north of the winze. Significant production during the year was derived from between the 3,100- and 2,300-foot levels. Some of this production was from the N'Kana part of the property, which is held by Vol Mines. Some stoping was started on the 3,700-foot level on this zone. On the 4,300-foot level a hanging-wall drift was started to the north to test the 103 Zone on and below the level.

By November 1967 drifting to the extent of 2,000 feet had been done on the 4,500-foot level, and the crosscut had entered the shear zone. On the 4,900-foot level a drift had nearly reached the shear zone. By the end of the year crosscutting to the shear zone on the bottom levels had been completed. Drifting and diamond drilling from these levels were proceeding on schedule. The drilling had resulted in some ore intersections and a few short ore shoots were intersected during drifting, but no tonnage estimates had been made.

In 1968 plans were announced for Con to test the property of Yellorex Mines to the south. The plans were for a drift south along the Campbell shear zone on the 2,300-foot level for a distance of nearly 5 miles. Drilling from surface on the Yellorex property had previously resulted in some ore-grade intersections.

The mine production for the years 1966 through 1968 was as follows:

Year	Quarter	Total employees	Tons milled	Rate t.p.d.	Recovered grade (oz./ton)	Ounces Au produced
1966	1	192	40,268	448	0.634	25,544
	2	201	40,361	443	0.622	25,049
	3	237	37,747	410	0.800	31,055
	4	240	37,664	410	0.664	25,033
	Year		156,040		0.683	106,681
1967	1	236	37,885	421	0.700	26,488
	2	234	40,356	447	0.725	29,262
	3	222	38,946	423	0.572	22,327
	4	227	39,916	434	0.679	27,809
	Year		157,103		0.673	105,886
1968	1	235	38,066	409	0.676	25,743
	2	221	39,507	433	0.664	26,263
	3	226	37,922	412	0.562	21,312
	4	218	36,627	397	0.596	21,808
	Year		152,122		0.625	95,126

The estimated ore reserves of Rycon Mines at April 30, 1967, were 188,200 tons averaging 0.77 oz./ton Au, compared with 149,300 tons averaging 0.72 oz./ton a year earlier. As of April 30, 1968, the ore reserves were reported to be 170,666 tons averaging 0.72 oz./ton gold.

Discovery Mines Ltd. (85-P-4; about 63° 11'25"N, 113° 53'45"W)

Discovery Mine is on Giauque Lake about 52 miles north-northeast of Yellowknife. Milling started at the property in January 1950. The property was initially serviced largely by aircraft from Yellowknife. However, in early 1960 a winter road was built to the property, and following that much of the fuel oil and other heavy supplies for the mine were delivered by truck. A record of production for the mine from 1961 through 1968 is presented in the following table.

Year	Tons Milled	Tons/day	Gold produced(oz.)	Mill Head grade(oz./ton)	Reserves at year end	Grade oz./ton
1961	55,163	140		1.18	84,923	0.82
1962	53,858	150	43,011	0.81		
1963	47,924	167	30,209	0.64	68,330	0.50
1964	77,830	212	47,470	0.61	174,756	0.84
1965	80,546	220.6	55,864	0.71	190,540	0.82
1966	82,848	227	60,145	0.74	142,994	0.66
1967	87,772	239	51,007	0.61	87,833	0.48
1968	86,612	237	34,172	0.40	Minor	Low

A record of developments at the mine is given by previous reports on the Mineral Industry of the Northwest Territories (Baragar, 1961; Baragar, 1962; Baragar and Hornbrook, 1963; Schiller and Hornbrook, 1964a; Schiller, 1965; Thorpe, 1966).

The mine had a net profit of $534,962 in 1966, the highest after 1961 (The Northern Miner, Mar. 23, 1967). Production and grade were both improved in comparison with 1965 and costs per ton were lower. The closing of the Discovery-owned LaForma mine, in the Yukon, early in 1966 was an important factor in the financial picture, since production had been maintained only at substantial loss. Proven ore reserves were reduced to 143,000 tons at the end of 1966, or about two-years production. The average grade for these reserves was 0.66 oz./ton Au.

The ore mined in 1966 was broken in stopes between 2,150-foot and 3,950-foot levels. Mill recovery for the year was 98.3 per cent. Production for the year was derived 55 per cent from the 4 B vein, 30 per cent from No. 16 vein, 9 per cent from the West Zone, and 2 per cent from the No. 3 vein. The production figures for 1966 and the subsequent two years are listed in the following table.

During the spring of 1966 approximately 1,556 tons of equipment and supplies were trucked to the property over the 65-mile winter road from Yellowknife.

It was reported (Can. Mining J., June, 1967, p. 9) that diamond drilling on the property, at a point about 2 1/2 miles south of the most southerly workings had indicated 100,000 tons grading 0.6 oz./ton Au. This deposit had been drilled to the 750-foot horizon and was open at depth. The gold is in a series of narrow, parallel and overlapping veins. There were no immediate plans for development of the deposit.

Development of the No. 4 and No. 16 veins was completed to the bottom of the mine on the 3,950-foot level during 1966. Work was started

Year	Quarter	Total employees	Tons milled	Rate t.p.d.	Recovered grade (oz./ton)	Ounces Au produced
1966	1	125	20,235	225	0.735	14,896
	2	119	20,483	225	0.898	18,408
	3	123	20,690	225	0.685	14,201
	4	122	21,465	234	0.587	12,589
	Year		82,873		0.726	60,094
1967	1	127	21,922	244	0.623	13,657
	2	129	21,912	241	0.608	13,337
	3	119	20,266	233	0.590	11,963
	4	117	21,452	235	0.560	12,031
	Year		86,693		0.588	50,988
1968	1	114	20,536	235	0.520	10,697
	2	102	21,586	236	0.422	9,102
	3	85	21,017	228	0.364	7,574
	4	73	23,474	258	0.289	6,792
	Year		86,613		0.399	34,165

on this level in June 1966. Crosscuts were put out from the 3,950-foot level for purposes of exploration drilling at greater depth, and this drilling was just being started at the end of the year. Routine exploration of all favourable structures in the area of veins Nos. 1, 4 and 16 was started.

About 14,600 feet of exploration drilling was done during the year, but this failed to indicate any new substantial ore shoots. Some areas which had not yet been tested were considered to have potential. These areas included the competent greywacke unit at shallow depth, and some wide areas of fracturing in greywacke to the southwest of the existing workings on the 24th level. Some intersections of gold-bearing quartz had been obtained in the latter area. Testing of the No. 16 vein structure between the 14th and 16th levels was planned.

Net profit for the first half of 1967 amounted to $233,713. The value of gold produced in the first 9 months of the year was $1,481,223. After adding $28,721 investment income and $51,644 for Emergency Gold Mining Assistance, and deducting operating costs, writeoffs and taxes, the net profit for the period was $376,065. A new vein, No. 19, was discovered on the 3,200-foot level and was developed for a length of 75 feet. Sampling indicated a grade of 0.55 to 0.60 oz./ton Au across a mining width of 4 feet. Diamond-drill intersections obtained in the vein on the 2,750-foot level assayed 0.78 oz./ton across 2.4 feet and 4.35 oz./ton across 2.8 feet.

During 1967 a higher mill rate, at 239 tons per day, was maintained in order to compensate for a lower average grade of ore. Mill heads during the year averaged 0.61 oz./ton Au in contrast with 0.75 oz./ton in 1966. Mining during the year was concentrated on the No. 4B and No. 16 veins, and stoping was restricted to between the 2,450-foot level and the deepest 3,950-foot level. The operating costs per ton of ore produced were down significantly to $16.27 per ton in contrast to $17.23 per ton in 1966. However, the operating costs per ounce of gold produced were up to $27.32 in 1967 in comparison with $23.74 in 1966. The price received per ounce of gold was $37.76, in comparison with $37.71 in 1966 and an average of $35.36 for the period 1950 to 1967. Underground exploration was accelerated during 1967 and underground diamond drilling was increased to 23,131 feet. Drives were

advanced to the area of the No. 19 vein, the most southerly in the mine, on the 2,750-, 3,350-and 3,500-foot levels. The work showed that the vein was generally narrow with erratic gold values. Ore mined from the vein on the 3,200-foot level averaged about 0.50 oz./ton.

The net profit of the company in 1967 was $463,351, down somewhat from 1966. From the start of production in 1950 to the end of 1967 a total of 932,174 tons of ore were milled at the mine and 989,403 ounces of gold were produced.

During the first quarter of 1968 the net profit was down to $55,900 from $108,772 for the corresponding period in 1967. A substantial underground exploration program at the property was being continued. This work included an exploration drift that was being driven on the 24th, 3,500-foot level to test a potential area well south of the mine workings. The grade of ore milled was down significantly to 0.53 oz./ton. This represented a progressive trend, with few interruptions, which had started in mid-1966 and was to continue at an accelerated rate throughout 1968. The one millionth ounce was produced by the mine in April 1968, and the one millionth ton of ore was produced later in the year.

For the first 6 months of 1968 the estimated income under the Emergency Gold Mining Assistance Act was $102,322, up from $37,038 in the corresponding period of 1967. The recovered grade of ore milled was down to 0.422 oz./ton in the second quarter. Exploration of a potential area south of the mine workings was not encouraging. The No. 19 vein was found to be of quite limited extent, although it had contributed a modest tonnage to ore reserves. The unsuccessful underground exploration program was suspended in mid-year.

During the third quarter of 1968 Discovery Mines sold 730,000 shares of Rayrock Mines Ltd. to Empire Films Ltd., reducing its holdings from 40 per cent of the issued capital to 22.4 per cent. The remaining ore reserves at Discovery Mine were reported to be marginal and mining operations were being continued on a salvage basis. Closing of the mine in March 1969 was anticipated.

The operating profit in 1968 was down 55 per cent from 1967 to $235,307. The net profit for the year was $93,879 due to significantly higher exploration expenditures. The estimated amount of Emergency Gold Mining Assistance for the year was $242,557, up from $97,338 in 1967. During the latter part of the year operating costs per ton of ore milled were reduced substantially and averaged $13.87 for the year. However, the operating costs per ounce of gold produced increased substantially to $35.15.

Approximately 70 per cent of the ore milled was derived from the No. 4B and No. 16 veins. Modest tonnages were mined from remnant areas in the upper workings of the mine. Underground diamond drilling during the year totalled 8,548 feet to bring the total during the life of the mine to 265,661 feet.

Underground work at the property stopped in March or April 1969, and all operations ceased in May of that year.

Camlaren Mine (85-1-14; about 62° 59'15"N, 113° 11'55"W)

The Camlaren Mine is on Gordon Lake about 28 miles east of Discovery Mine. In 1937 and 1938 a shaft was sunk to a depth of 390 feet on

the Hump vein and levels established at 200 and 350 feet (Lord, 1951, p. 89). Drifts and crosscuts on these levels totalled 2,241 feet and developed the vein for an average length of 335 feet. This underground work indicated reserves of 13,177 tons grading 0.86 oz./ton Au (uncut) or 0.62 oz./ton (cut) (Lord, 1951). Three ore shoots on the 200-foot level had a total drift-length of 152 feet and four shoots on the 350-foot level a total drift-length of 270 feet; the shoots ranged from 1 foot to 7 feet in width. The Hump vein occurs in thinly bedded slates and greywackes of the Yellowknife Group and is partly controlled by a tight anticlinal fold.

The No. 2 shaft was sunk to explore the "31" vein on Zenith Island, 1 mile southwest of the Hump vein, but no ore shoots were found in the vein. Likewise, diamond drilling failed to locate ore shoots in the H vein which is located on a small island about 3,000 feet west of the Hump vein, although surface sampling indicated a grade of 2.09 oz./ton Au (uncut) or 1.22 oz./ton (cut) (Lord, 1951). The H vein averages 15 inches wide on surface and is exposed for a length of 110 feet.

The drilling done by Camlaren Mines totalled 14,994 feet and included testing of the Hump vein to a depth of 565 feet.

In 1962 Discovery Mines entered into an agreement with Camlaren whereby Discovery would mine ore from the two developed levels and truck it to the Discovery mill for treatment. The operation was essentially a bulk test to determine the grade of the ore and the feasibility of mining the deposit. A diesel-powered mining plant was installed, buildings renovated, underground workings de-watered and 13,000 tons of ore mined and hoisted to the surface during 1962. The following winter 12,174 tons of the ore were trucked to Discovery over a 40-mile winter road. The ore was milled during the period June to August 1963. The grade indicated by gold recovery was 1.14 oz./ton Au, substantially higher than indicated by mine sampling. The profit to Discovery Mines from this undertaking was $30,790.

An extensive underground exploration program was planned for the property by Discovery Mines in 1966. These plans included deepening of the shaft 500 feet and drifting on the Hump vein at a depth of 850 feet. Diamond drilling was planned from this level to test the vein at the 1,150-foot horizon. The estimated costs of the program was $317,000. Completion of this exploration would have earned Discovery a 66 2/3 per cent interest in the property. This program was not conducted as planned and in May 1968, it was announced (The Northern Miner, May 9, 1968, p. 15) that the agreement with Camlaren Mines had been extended for 5 years to Dec. 31, 1973. The program would now cost considerably more than originally estimated. As of the end of 1967 Discovery Mines Ltd. held 70 per cent of the outstanding shares of Camlaren Mines Ltd.

During 1968 some rehabilitation of plant and buildings was carried out at the property. In addition, shaft timber and diesel fuel was transported over a winter road to the mine. While Discovery was hoping for much higher gold prices before undertaking the planned exploration and development program, consideration was being given to initiation of the program in 1969. (Discovery Mines, Annual Report, 1968).

Tundra Gold Mines (64° 02'N, 111° 11'W)

Tundra Mine is located a few miles south of Matthews Lake and approximately 150 miles northeast of Yellowknife. The mine was brought into production on April 1, 1964. The mining operations and geology have been reviewed by Schiller (1965) and production and mine developments in 1965 have been noted by Thorpe (1966). The general geology of the area is shown on maps included in a report by Moore (1956). The gold-bearing quartz veins lie along and near the contact between sediments and volcanics of the Yellowknife Group. This contact strikes about N15° W and dips 75° E.

The mine was developed on the Matthews vein which averaged 4 feet in width and was ore bearing for a length of at least 2,200 feet. The No. 2 vein was located 3,000 feet south of the headframe and about 1,300 feet south of the south end of the Matthews vein. Ore reserves at the mine as of March 31, 1965, were 100,000 tons with an average grade of 0.76 oz./ton Au and 200,000 tons of probable ore with an average grade of 0.50 oz./ton Au. The mine reached its desired production level of 140 tons per day, or about 3,000 ounces of gold per month, in March 1965. During 1965 development work was carried out on the No. 2 vein.

Operations at the mine went from difficult to very bad during 1966. Tons milled and ounces of gold recovered both declined for each quarter during the year; the only favourable statistic was an increase in grade to 0.476 oz./ton Au in the fourth quarter over that for the third quarter. The following table gives quarterly figures and totals for the year.

	Tons milled	Rate t.p.d.	Oz. Au produced	Grade oz./ton
1st Quarter	13,719	153	8,437	0.614
2nd Quarter	14,354	158	7,787	0.541
3rd Quarter	13,188	143	5,567	0.422
4th Quarter	10,842	118	5,165	0.476
	52,103	143	26,956	0.517

The work force at the mine was up to strength by the end of the year and it was considered possible to bring the mill back up to capacity production by early March 1967. However, substantial operating losses were anticipated for January and February 1967.

At least 650 feet of drifting was accomplished north of the shaft during 1966 but revealed no new ore. The No. 2 vein was opened up by stoping at two locations and proved to be below ore grade. Drifting south of the shaft on the first and second levels resulted in the development of two new ore shoots. Some ore was developed by raising from the 6th level to the 4th level at a location 1,400 feet south of the shaft.

Probable ore reserves in the Matthews vein at the end of 1966 were estimated at 47,000 tons averaging 0.49 oz./ton Au. This indicates that the grade estimated for the reserves as of March 31, 1965, was overly optimistic. The proven ore reserves at March 31, 1967, were reported to total 40,476 tons with a grade of 0.585 oz./ton gold (The Northern Miner, Aug. 10, 1967, p. 4).

Profitability of operations improved during 1967 and development work was sharply curtailed in anticipation of closing of the mine. For the 6-month period ended September 30 the company earned an estimated operating profit of $130,312 which was converted to a loss of $8,587 after provision for depreciation and debenture interest (Western Miner, Dec. 1967, p. 65). During this period 15,906 ounces of gold were produced from the milling of 26,131 tons of ore. The mine ceased operations in January 1968. During its last 9 1/2 months of operation, from April 1967, the mine produced gold valued at nearly $900,000. The operating profit for the fiscal year ended March 31, 1968, was $32,595 and the net loss was $142,678. The production figures for the mine in 1967 were as follows:

	Tons milled	Rate t.p.d.	Oz. Au produced	Grade oz./ton
1st Quarter	10,204	113	4,971	0.486
2nd Quarter	12,964	144	8,806	0.679
3rd Quarter	13,167	143	7,083	0.537
4th Quarter	13,459	146	5,390	0.400
	49,794	137	26,250	0.527

The reserves remaining in the mine are of submarginal grade. A substantial rise in the price of gold was considered necessary before consideration could be given to re-activation of the mine. The company planned to participate in exploration programs with associated companies.

Echo Bay Mines Ltd. (ECHO BAY claims)
(86-L-1; about 66° 05'35"N, 117° 59'40"W) (Silver, Copper)

Echo Bay Mine is at Port Radium on Great Bear Lake and makes use of the mill and other surface plants which were at first leased, and then purchased in 1966, from Eldorado Mining and Refining Company Ltd. (now Eldorado Nuclear Ltd.). Production commenced in October 1964, and milling was at a rate of 85 tons per day at the end of the year. During the final 6 months of 1965 the daily rate was just in excess of 100 tons.

A review of the geology and mine operations has been given by Schiller and Hornbrook (1964), Schiller (1965) and Thorpe (1966). The mine commenced production in October 1964, after the property had been optioned from Cominco in 1963. Production was up to a daily rate of about 140 tons at the end of 1966 from a rate of about 85 tons at the end of 1964 and 103 tons at the end of 1965. The average grade of the ore remained quite constant at close to 35 oz./ton Ag from the start of production to the end of 1966.

Early in 1966 rich ore containing both argentite and native silver was encountered in the No. 6 vein. Drilling indicated continuity of the mineralization below the No. 2 adit level. Planning had been completed for a low-level adit to be driven about 2,300 feet to beneath the mine workings from the northeast end of the inlet just east of the mill site. The main object of the adit was to give access to the silver-bearing veins at approximately 160 feet vertically below the No. 2 adit level. An additional advantage was elimination of the necessity to truck over a steep hill from the ore bins at the higher adits to the crusher.

By the late spring of 1966 much of the high-grade ore had been drawn from the No. 6 vein. Consequently the mill heads had declined somewhat and ore chutes were being drawn selectively to maintain a good grade. Development work was being concentrated on stopes 8.3-1 and 8.3-3 and a number of chutes were being established for drawing ore from the 8.3-1 stope. Driving of the low-level adit was being started at an elevation of 31 feet above the lake, somewhat above the elevation originally planned in order to lessen the problem created by a deep frozen mantle of talus and overburden. A new cyclone classifier had been delivered to the property and an increase in the milling rate to 135 tons per day was planned. Plans had also been made for moving the mine office from a bunkhouse near the lake to the building that had been used as an office by Eldorado Mining and Refining Ltd., and for a similar relocation of the cookery to the former recreation hall.

Silver production in 1966 was up to about 1,573,752 ounces from 1,408,246 ounces in 1965, and copper was up to 1,643,222 lb. from about 1,100,000 lb. The following table gives quarterly figures and totals for 1966.

	Men working	Tons milled	Rate t.p.d.	Cu(%)	lb. Cu	Ag (oz./ton)	oz./Ag
1st Quarter	67	8,511	95	1.7	286,813	43	365,721
2nd Quarter	75	9,820	108	1.8	349,882	33.6	329,606
3rd Quarter	74	12,698	138	1.6	407,286	35.0	444,924
4th Quarter	84	12,810	139	2.3	600,241	33.8	433,501
Year	75	43,839	120	1.9	1,643,222	35.9	1,573,752

In the fiscal year from March 1, 1966, through Feb. 28, 1967, the mine produced 1,532,000 oz. Ag and 995,000 lb. of by-product copper.

The No. 3 low-level adit had been advanced 1,686 feet at the end of November 1966, at about which time it must have been beneath the previous workings. By the end of January 1967, drifting had been accomplished for several hundred feet in either direction along the vein and a raise had been started to intersect the previous workings in the 8-3 stope area. Ore continued to be drawn from the 8-3 shrinkage stope via the upper adit while completion of the raise from the No. 3 adit was awaited. The No. 2 vein was found to be ore grade on the No. 3 adit level. Some minor pitchblende was also encountered on this level. Plans were under development for a drill program to test the ore potential below the No. 3 adit level. A possibility being considered at that time was that access to ore at greater depth, when that was required, might best be gained through the old shaft and workings of Eldorado Mining and Refining.

The mine enjoyed very profitable production through 1966, although labour and transportation costs for such an isolated operation are necessarily high. The mill and other surface facilities, which previously had been leased from Eldorado Mining and Refining, were purchased prior to the end of the year.

In July 1967, the shareholders of Echo Bay Mines tendered 46,700 shares to International Utilities Ltd. in response to a bid by that company to purchase control at $60 per share. The purchase price indicated an evaluation of the mine of about $6,500,000. This acquisition gave International Utilities 43 per cent of the shares of Echo Bay Mines Ltd., in addition to a

previous holding of 20.18 per cent interest. The direct and indirect ownership in Echo Bay Mines Ltd. by International Utilities was variously reported as 73 per cent (Eng. Mining J., Aug. 1967, p. 145) or 76.9 per cent (Edmonton Journal, Jul. 18, 1967).

In the 7 months from March through September 1967, the mine produced 1,616,307 oz. silver and 640,000 lb. copper as compared with 1,532,002 oz. silver and 1,687,000 lb. copper for the full year of 1966. By October 1967, an underground hoistroom and shaft station had been completed in preparation for the sinking of an internal shaft to a depth of 500 feet.

On the No. 2 level one stope reportedly averaged 0.50% U_3O_8. Although part of the pitchblende entered the silver concentrate, the company did not receive payment for the uranium (The Northern Miner, Oct. 19, 1967, p. 1). In late 1967 an effort was being made to concentrate the uranium in the mill. On the level of the No. 3 adit "significant" uranium values were reported from the southwest part of the mine area. It was reported that the uranium-bearing vein which was encountered on this level also contained 13 oz./ton Ag (Western Miner, Aug. 1968, p. 28). This uranium-silver ore was being stockpiled for treatment when the vein received development in the future.

Mining by Eldorado Mining and Refining Ltd. prior to 1960, under a lease-royalty agreement, on a 3-claim property held jointly by Dominion Explorers and Falconbridge Nickel Mines Ltd. resulted in indicating a body of copper ore containing an estimated 30,000 tons (The Northern Miner, Oct. 19, 1967, p. 1 and Oct. 26, 1967, p. 5). This deposit was reported to grade about 10% Cu and to possibly have some native silver around its periphery. The body is within about 3,000 feet of the workings of the Echo Bay Mine.

During the winter of 1967-68 Byers Transport Ltd. trucked 1,500 tons of freight to the property by winter road. In this trucking operation 2,000 tons of concentrate were trucked out from the property in 80 loads on the return trips.

By early 1968 ore had been developed on the No. 3 level in one continuous shoot 520 feet long, with backs of 200 feet, and an average width of 6 feet. The vein has a dip of 70° with competent walls. Stoping on the vein was providing regular millfeed. Grade for this ore shoot was well in excess of 75 oz./ton silver.

By July 1968 sinking of a 3-compartment winze had been completed to a depth of 510 feet below the No. 3 level. The winze was sunk by Haste Mine Development Ltd. under contract. This winze provided for three additional levels at 150-foot intervals and a 60-foot sump. Drilling had confirmed the persistence of the silver-copper vein, without any decrease in size or grade, to the depth of the No. 4 level (Western Miner, Aug. 1968, p. 28).

In the fiscal year ended February 29, 1968, the Echo Bay Mine produced 3,590,000 ounces of silver from the milling of 38,000 tons of ore. In the first 6 months of 1968 the mine produced 1,587,508 oz. of silver and 546,102 lb. of copper from 18,472 tons of ore milled, for an average recovered grade of about 85 oz./ton Ag.

Production at the mine in 1967 and 1968 is presented in the following table on a quarterly basis.

Year	Quarter	Men working	Tons milled	Daily rate	Recovered Cu(%)	Grade Ag (oz./ton)	Production Cu(lb.)	Ag (oz.)
1967	1st	73	11,871	132	2.2	39.0	525,329	462,522
	2nd	80	7,943	87	1.6	127	262,368	1,005,995
	3rd	95	9,672	104	1.5	50.7	290,104	490,881
	4th	81	9,512	104	1.1	107.7	220,567	1,025,245
Total	Year		38,998	108	1.6	76.2	1,298,368	2,984,643
1968	1st	91	9,559	105	1.17	99.3	224,003	949,968
	2nd	109	9,062	100	1.38	64.9	250,795	587,689
	3rd	124	9,456	104	1.35	58.4	256,079	550,903
	4th	119	8,905	103	1.03	53.3	184,079	474,939
Total	Year		36,982	103	1.24	69.4	914,956	2,563,499

An exploratory surface diamond-drilling program was planned during the latter part of the 1968 season. However, the results of this drilling program are not known to the author.

Geological mapping at 200 feet to the inch was done in late August 1968, on the ECHO BAY 11 and 12 claims. These claims are in a heavily dissected area which dips steeply into Glacier Bay. A series of tuffs, porphyritic andesite and amygdaloidal andesite were mapped which belong to the upper part of the Echo Bay Group. This rock series has a general east-west strike and dips south at about 30°. A scintillometer was carried during the mapping and faults and fractures were checked for radioactivity. A small showing was located at the joint south claim post of the two claims and consists of an east-west striking hematitized fracture zone with some evident copper staining. A sample across a width of 1 foot assayed 4.0 oz./ton Ag and 0.02% U_3O_8.

Terra Mining and Exploration Co. Ltd. (A 1-21 claims)
(86-E-9; about 65° 36'N, 118° 07'W) (Silver, Bismuth, Copper, Cobalt)

The "A" group of claims is located on the Camsell River about 4 miles downstream from the old Camsell River Silver Mines property. The A 1-17 claims were recorded by Carl Sutton on July 4, 1966, and claims A 18-21 were added to the group in mid-September 1966. The claims were subsequently acquired by Silver Bear Mines Ltd., a wholly-owned subsidiary of Terra Mining and Exploration Co. Ltd. The property is a restaking of the northern part of the former YAW group.

The silver-bismuth-cobalt-copper vein exposed on surface (approximately 65° 36'14"N, 118° 06'45"W) was discovered in 1960 by a prospector working for Eldorado Mining and Refining Ltd. and the 45-claim YAW group was subsequently staked (Allan, 1960). Some mapping, surface sampling and diamond drilling were carried out late that season on the North Showing. The drilling consisted of four holes totalling 942 feet. Two of these holes failed to intersect any appreciable values and another hole gave assays of 3.78 oz./ton Ag and 2.12% Cu for a core length of 1 1/2 feet, with 2.35% Cu for a length of 6 feet elsewhere in the hole. The fourth hole gave in excess of 20 oz./ton Ag for a core length of 10.3 feet, and 3.92 oz. Ag over a contiguous section of 5 feet. Within the high-grade section a core length of about 5 inches assayed 1,493 oz./ton Ag and 9.5% of Bi. The showing was considered to be too small and was not investigated further by Eldorado.

The northern part of the YAW group was optioned from Eldorado Mining and Refining in 1963 by Echo Bay Mines Ltd., and three holes were drilled. The property was then abandoned until it was restaked as the "A" group in 1966.

The property was visited by the author on July 12, 1966. Mr. W. L. McDonald of Yellowknife prepared a preliminary report on the property from an investigation carried out in September 1966. The main vein exposed on the surface is roughly 14 inches wide and runs transverse to a gossan zone along a mineralized sheared tuff horizon (No. 3 zone). While probably longer, the vein can be traced for about 10 feet northeast to the contact with black siliceous tuff. Here, it is reported, the vein turns at right angles and can be followed southeast a further 40 to 50 feet along the contact. The vein material along this section is much narrower and consists mainly of coarse carbonate containing only very minor arsenides. The main transverse section of the vein contains abundant grey arsenide minerals and coarse crystals of native bismuth in a sheared and highly altered matrix. Mixed stains of erythrite, annabergite and malachite are well developed. Bismuth, skutterudite, safflorite, rammelsbergite, and minor gersdorffite, pararammelsbergite, cobaltite, chalcopyrite and bismite are present in the vein. Matildite has been identified as the main silver-bearing mineral in the surface exposure of this vein (Harris and Thorpe, 1969).

The general geology of the area (see Geol. Surv. Can., Map 1055A and Map 333A) is only very poorly known due to the brief reconnaissance nature of the investigations by D. F. Kidd (1936b) and J. M. Bell (1902). This is unfortunate in view of the present very great interest in the economic possibilities of the area. The deposit lies in a series of rocks which appear to be extrusive and/or pyroclastic (ignimbritic) feldspar porphyries of the Echo Bay Group. These rocks form a northwest-striking and steeply dipping belt about 3 to 5 miles wide. Sulphide-bearing andesitic (?) rocks which appear to be intercalated with the more acidic rocks, and which form a prominent gossan around the main surface showing, may be intermediate to basic tuffs.

An exploration program was initiated on the A group by Silver Bear Mines in May 1967. Up to mid-August 1967, $52,000 had been spent on the property, principally on a program of diamond drilling. Equipment was flown to the property early in May and a camp was established. Drilling was started on May 22 and by August 5 a total of 3,354 feet in 12 holes had been completed. Eight holes had been finished when the property was visited by the author on July 28.

The first 4 holes were drilled from one location, approximately the same location from which Eldorado Mining and Refining obtained the very high-grade intersection in drilling carried out in 1960. The first of the 4 holes intersected mineralization which graded 15.1 oz./ton Ag over a true width of 2.7 feet. Coarse crystals of native bismuth and very fine grained grey arsenides were evident in the core from this hole. The other three holes from this location failed to intersect significant mineralization.

Hole No. 5 was located 80 feet to the northwest (along the No. 3, gossan, zone) of the first setup and obtained an intersection of 882.9 oz./ton Ag across a true width of about 0.7 feet at a horizontal distance of approximately 210 feet northwest of the intersection in Hole No. 1. Hole No. 6 intersected the zone 65 feet farther west but failed to give a high-grade intersection.

Holes No. 7 and 8 intersected a good zone containing native silver and bismuth. Core from Hole No. 7 assayed 55.1 oz./ton Ag across a width

Diamond Drill Results

Hole	Bearing	Dip	Length (ft.)	Intersection	Core length	True width	Co(%)	Bi(%)	Cu(%)	Ag (oz./ton)
1	S22° E	39°	270	167.5'-169.1'	1.4	0.8		0.08	6.94	3.3
				169.1'-170.2'	1.1	0.6		0.06	2.02	1.1
				203.6'-208.3'	4.7	2.7		0.25	7.51	15.1
				214.4'-216.0'	1.6	0.9	0.08	0.08	4.69	4.1
				224.3'-225.5'	1.2	0.7	1.24	0.15	0.24	3.9
2	S8° W	50°	170	No intersection						
3	Due S	30°	150	76'-77'	1.0	0.8			1.98	3.3
				99'-100.5'	1.5	1.1			3.39	1.9
4	S22° E	55°	416	247'-252.5'	5.5	2.4			5.48	3.6
5	S35° W	50°	149	116'-117'	1.0	0.7	2.09	8.50	0.13	882.9
				117'-121'	4.0	2.6		0.06	0.14	6.0
6	S35° W	50°	255	160'-163'	3.0	2.2	0.03	0.05	1.95	2.5
				205'-210'	5.0	3.2	0.05	0.24	1.31	5.3
				222'-224'	2.0	1.3	0.08	0.25	3.05	5.6
7	N55° W	45°	301	257.5'-262'	4.5				0.86	2.8
				262'-265'	3.0				2.31	3.4
				265'-266'	1.0	5.7	2.48	2.75	3.60	55.1
				266'-270'	4.0				2.47	3.5
8	N15° E	45°	290	94'-99'	5.0	3.6	0.04	0.006	0.06	134.4
				121'-126'	5.0	3.6	0.15	0.30	5.94	36.4
				168.5'-173.5'	5.0	3.6	0.08	0.13	1.63	6.0
				237'-241'	4.0		0.08	0.10	0.78	1.8
9				136'-141'	5.0		0.05	0.05	3.85	2.5
				203.5'-204.5'	1.0		tr.	tr.	3.37	6.1
				295.5'-298.5'	3.0		0.02	–	3.11	3.3
10				69'-71'	2.0		0.20	0.02	0.09	20.2
				139'-143'	4.0				0.21	1.5
				143'-149.5'	6.5		0.07	0.05	1.40	3.2
11				332'-336'	4				0.91	1.2
				351'-354.5'	3.5				0.41	1.8
				354.5'-355.5'	1		0.01	0.18	0.04	2.7
12				321.5'-325'	3.5		0.02	0.04	1.58	0.4
13				No significant assay results						
14				111'-113'	2				0.87	0.2
15				71'-77'	6				0.81	20.7
				77'-80'	3				1.40	3.3
16				148'-151'	3				0.20	308.3
				155'-166.5'	11.5				0.30	17.1
				171'-177'	6				2.27	97.3
				228'-230'	2				0.53	7.5
17				158'-161.5'	3.5				1.45	2.5
				176'-179'	3				3.01	0.3
				179'-184'	5				0.53	1.2
				184'-190'	6				0.68	1.5
18				167.5'-170.5'	3				4.99	1.8
				170.5'-174.5'	4				3.44	0.9
				193'-194'	1				6.59	1.7
19				120'-124'	4				2.04	0.2
				243'-244'	1				0.26	64.1
				289'-294'	5	0.24			3.44	2.2
				294'-297.5'	3.5	0.18			5.28	3.6
				301.5'-303'	1.5				1.50	10.2
				312'-315'	3				1.31	2.2

Diamond Drill Results

Hole	Bearing	Dip	Length (ft.)	Intersection	Core length	True width	Co(%)	Bi(%)	Cu(%)	Ag (oz./ton)
20				373'-376'	3				1.74	1.5
				438'-444'	6				1.57	2.1
21				110'-111.5'	1.5				5.96	4.2
22				80'-82'	2				0.58	2.0
				130'-136'	6				4.06	0.5
				250'-255'	5				4.59	1.9
				261'-264'	3				3.90	2.1
				264'-269'	5				0.94	2.3
				269'-269.5'	0.5				1.07	546.3
23				177'-181'	4				5.79	5.7
				181'-185'	4				2.30	8.3
				185'-187'	2				1.08	5.2
				296'-299'	3				0.55	1.8
				308'-312'	4				4.00	36.6
				312'-316'	4				0.86	436.5
				316'-320'	4				0.11	44.5
				320'-323'	3				0.05	53.6
24				106'-107.5'	1.5	0.22	1.85		1.63	1.2
				320'-325'	5	0.06	0.05		2.25	0.9
				325'-330'	5	0.04	tr.		4.01	1.8
				330'-335'	5	0.11	0.10		11.66	4.4
				335'-340'	5	0.15	0.26		5.94	4.3
				340'-346'	6	2.02	0.63		2.12	8.8
				359'-365'	6	2.92	0.74		0.20	66.5
				365'-369'	4	0.33	0.04		0.06	1.6
				369'-374'	5				4.61	3.6
25				74'-76'	2				3.75	6.7
				80'-83'	3				2.54	3.4
				105'-106'	1	0.93	0.16		0.08	3.4
				205.5'-208.5'	3				1.31	2.0
				208.5'-209.5'	1	0.01	tr.		0.05	64.0
				192'-199'	7				4.04	2.7
27				270'-275'	5				4.96	4.3
				275'-280.5'	5.5				3.13	9.6
				280.5'-285'	4.5				0.54	8.0
				285'-289'	4				0.18	20.0
				289'-292'	3				0.11	27.0
28				290'-295'	5					30.3
				295'-300'	5				0.88	6.6
				300'-305'	5				1.17	18.4
				305'-310'	5					3.4
29				99.5'-102'	2.5				1.88	2.4
				199'-204'	5				1.15	2.8
				204'-204.5'	0.5				0.14	25.9
				204.5'-210.5'	6				0.34	1.5
30				218'-223'	5				2.21	0.6
31				185'-190'	5				1.78	1.6
				190'-195'	5				0.67	6.1
				242'-244'	2				0.82	7.4

of 0.7 feet at a distance of 105 feet west of the intersection in Hole No. 5. Hole No. 8 gave two intersections at about 140 feet farther west and slightly to the south. These intersections assayed 134.4 oz. and 36.4 oz./ton Ag, each across a true width of about 3.6 feet, and are separated horizontally by about 16 feet. In Hole No. 8 dendritic silver, possibly partially replaced by argentite or sheathed by rammelsbergite, appeared to be present in calcite. In these holes the rock is not sheared nor is there a definite vein present; silver and bismuth are present as stringers or replacement masses in a narrow zone of red rock. Marcasite-rich zones containing good chalcopyrite mineralization (No. 3 zone) were intersected at a depth of about 75 or 80 feet in these holes. The sulphides are predominantly very fine grained by recrystallized lenses and patches of pyrite or marcasite are present. A small amount of the chalcopyrite in these zones is present in fractures cutting the very fine grained sulphides and the host rock.

Some 20 holes had been completed by the end of September or early October and when the drilling was stopped just before the Christmas-New Year's season a total of 9,306 feet had been drilled in 31 holes. The drilling was carried out along a length of about 1,400 feet but the main intersections were along a length of about 400 feet. The latter part of this drilling was concentrated on tracing the main mineralized zone to a depth of 300 feet. The first 23 holes drilled by Terra were reported to have indicated a high-grade section with an average true width of 6 feet which graded 93.8 oz./ton Ag and 1.96% Cu. No length was reported for this section nor was it indicated whether or not it persisted from the surface to a depth of 300 feet. By the end of 1967 a decision had been reached to test the zone by underground development. The better grade assays resulting from the diamond drilling are presented in a table, pages 170, 171. The baseline for the grid has its origin approximately 800 feet S19° E from the No. 3 post of claim A 14, 650 feet south of the Camsell River, and about on the surface exposure of the arsenide vein which crosses the gossan zone. The baseline strikes N50° W and cuts across the northeast part of claim A 8.

A few of the samples (pages 170-171) were also assayed for zinc and the best results are listed below:

Hole	Intersection	Core length (ft.)	Zn(%)
22	130'-136'	6	7.01
25	74'-76'	2	3.56
	80'-83'	3	0.46
	204'-205.5'	1.5	1.48
	208.5'-209.5'	1	0.61
31	185'-190'	5	1.93
	190'-195'	5	0.80

Following assessment of all the diamond drilling accomplished in 1967 it was reported that 6 zones had been indicated and that proven ore reserves of 500 to 600 tons of commercial ore per vertical foot had been blocked out to a depth of 450 feet (News of the North, Mar. 28, 1968). The average grade of the drill core for 29 intersections was reported as 66 oz./ton Ag, 1.88% Cu, and some Co and Bi. Plans for a shaft inclined at 17° to 20° were also announced. At this stage the silver-rich drill intersections were interpreted to represent parallel or en echelon zones with the same attitude as the No. 3 zone.

Later (Western Miner, Aug., 1968, p. 32) the reported ore situation at the property was revised or stated in different terms as follows:

> "The president advises that the company's consultants have estimated an average mineable reserve of 700 tons of ore per vertical foot to a possible depth of 415 feet. The ore, he states, has an average grade of 32 oz. silver per ton with 2.5% copper, 0.5% cobalt, and 0.5% bismuth."

Equipment for shaft sinking was transported to the property by Byers Transport by winter road. Shaft sinking by Canadian Mine Service Ltd. started about mid-April 1968. The inclined opening was about 12 feet high and 15 feet wide and was reported to cost $72 per foot for a 2,000-foot contract, with all equipment provided by the contractor and only fuel and camp provided by the company. The incline was down 500 feet on a strike of N79° E when the property was visited on May 16. When the property was again visited on July 13 about 1,800 feet of the incline had been completed. After going about 1,200 feet, or a distance giving a horizontal projection of about 1,150 feet, the incline swings to a southeast direction and follows the No. 3 zone for about 300 feet and then turns to a direction of about N60° E to intersect the No. 1 zone.

The chalcopyrite-bearing nearly massive sulphide zone, No. 3 zone, here consists of very well layered and very fine grained sulphides. These sulphides consist largely of marcasite of syngenetic appearance and the host rocks are probably intermediate tuffs. Scattered pyrite globules are present in ignimbritic (?) rhyolite. It has been reported (Western Miner, Aug. 1968, p. 32) that this sulphide zone contains 1-2% Cu across a true width of 20 feet. However, it has been reported that the sulphides grade only a few ounces per ton silver, probably not more than about four ounces. Muck samples from the No. 3 zone were reported to have assayed 8-12 oz./ton Ag and 3-10% Cu.

Silver-bearing mineralization consisting of megascopically visible bismuth and arsenides is present in carbonate and quartz-carbonate veins, which sometimes also contain minor purple (rarely blue or green) fluorite. These are generally narrow veins which, for the most part, trend across the length of the No. 3 and No. 1 zones. Another common type of vein, apparently up to 6 inches or more in width, consists of quartz and minor feldspar and contains fairly abundant chalcopyrite and sphalerite. These veins are commonly bordered by massive sericite (?) in radiating masses. The sericite (?) has the appearance and colour of serpentine. Some arsenopyrite, and possibly glaucodot, crystals occur in these veins.

The No. 5 zone was apparently intersected in only a single drillhole. This intersection assayed 113.61 oz./ton silver, 0.09% copper, 1.06% bismuth, and 0.26% cobalt (Western Miner, Aug. 1968, p. 32).

The rocks intersected by the main section of the decline are uniform-appearing feldspar porphyries. These rocks are flesh coloured and contain scattered red and tan feldspar phenocrysts and chloritized remnants of mafic grains. A few of the chalcopyrite-bearing sericite-bordered veins are evident along the decline in this area.

The fact that most of the silver-bearing veins trend transverse to the length of the interpreted mineralized zones, and to the strike of the host rocks, a fact which might have been anticipated from the surface showing, means that tonnage or grade estimates for the property will need to be cut drastically. This attitude of the silver-bearing veins was not appreciated prior to the underground work.

An underground diamond-drilling program consisting of 3,011 feet of drilling in 22 holes was carried out on the property, under contract with Inspiration Drilling Ltd. between August 28 and October 28, 1968. No samples were taken from the core of holes 2, 5, 7, 11, 13, 18, 20 and 22 in this underground program. The assay results are listed below for the intersections which graded better than 1 oz./ton Ag or 2% Cu.

Hole No.	Intersection	Core length(ft.)	Cu(%)	Ag(oz./ton)
U-01	37.8'-38.3'	0.5	0.24	4.7
U-03	130.5'-131.5'	1	0.10	1.6
U-04	193'-194'	1	2.28	1.2
U-06	63.5'-64.5'	1	0.05	32.6
	72.8'-73.6'	0.8	tr.	15.8
U-08	36'-38'	2	2.48	0.5
U-09	46'-47.5'	1.5	5.65	6.5
	61'-62'	1	3.75	2.6
	67'-67.5'	0.5	1.51	3.9
	71'-76'	5	0.62	3.5
	76'-90'	14	0.39	22.1
	96'-99.5'	3.5	0.82	2.7
U-10	27'-42'	15	2.98	7.36
U-12	44.5'-44.9'	0.4	0.05	22.1
U-14	50.5'-51'	0.5	0.02	805.6
U-15	87'-88'	1		124.6
	88'-89'	1		16.2
U-16	90'-96'	6		2.3
U-17	163'-166.5'	3.5	0.60	145.0
U-19	59'-67'	8	5.92	9.4
	70'-71'	1	0.36	5.0
	80'-86'	6	1.23	4.7
	192'-193'	1	1.95	4.3
U-21	35'-41.5'	6.5	0.94	4.3

Raising was started on the property in September 1968. The raise was continued to surface about 320 feet above the level of the East Stub Drift which was driven about 100 feet southeast along the main mineralized zone.

Before the end of 1968 a decision had been made to construct a small mill on the property. Plans were to transport equipment for a mill with an initial capacity of 100- to 125-ton-per-day to the property during the winter by truck (Byers Transport). A $1,500,000 joint venture for construction of the mill was let to E.G.M. Cape and Company and Elliott Savage and Associates Ltd. of Vancouver (The Northern Miner, Dec. 26, 1968, p. 3). It was estimated that 60 to 70 men would be on the site for construction of the mill. Target date for completion of the mill and for the start of production was August 1, 1969.

REFERENCES

Allan, J.F.
1960: Camsell River Camp, Eldorado Mining and Refining Ltd.; Geol. Surv. Can., Open File No. 4, released Nov. 3, 1967.

Baragar, W.R.A.
1961: Mineral Industry of District of Mackenzie, Northwest Territories; Geol. Surv. Can., Paper 61-3, 29 pp.

1962: Mineral Industry of District of Mackenzie and part of District of Keewatin 1961; Geol. Surv. Can., Paper 62-1, 41 pp.

Baragar, W.R.A., and Hornbrook, E.H.
1963: Mineral Industry of District of Mackenzie, 1962; Geol. Surv. Can., Paper 63-9, 44 pp.

Barnes, F.Q.
1951: Snowdrift map-area; Geol. Surv. Can., Paper 51-6, 30 pp.

1951: McLean Bay map-area, District of Mackenzie; Geol. Surv. Can., Paper 52-5, 25 pp.

Bell, J.M.
1902: Report on the topography and geology of Great Bear Lake and of a chain of lakes and streams thence to Great Slave Lake; Geol. Surv. Can., Ann. Rept., vol. 12, 1899, Part C, pp. 1-36.

Bostock, H.H.
1967: Geological notes, Itchen Lake map-area, District of Mackenzie, part of 76E and 86H; Geol. Surv. Can., Paper 66-24, 13 pp.

1968: Gold-arsenopyrite-loellingite-pyrrhotite deposits in amphibolite, Itchen Lake-Contwoyto Lake area, District of Mackenzie; in Report of Activities, November 1967 to March 1968, Geol. Surv. Can., Paper 68-1, Pt. B, pp. 72-76.

Boyle, R.W.
1961: The geology, geochemistry, and origin of the gold deposits of the Yellowknife District; Geol. Surv. Can., Mem. 310, 193 pp.

1968: The geochemistry of silver and its deposits; Geol. Surv. Can., Bull. 160, 264 pp.

Brown, I.C.
1958: Geological map of the District of Mackenzie, Northwest Territories; Geol. Surv. Can., Map 1055A.

Canadian Mines Handbook 1969-1970, Toronto, The Northern Miner Press Ltd.

Douglas, R.J.W., and Norris, D.K.
1960: Virginia Falls and Sibbeston Lake map-areas, Northwest Territories; Geol. Surv. Can., Paper 60-19, 26 pp.

Fraser, J.A.
1960: North-Central District of Mackenzie; Geol. Surv. Can., Map 18-1960.

1964: Geological notes on northeastern District of Mackenzie, Northwest Territories; Geol. Surv. Can., Paper 63-40, 20 pp.

1967: Hardisty Lake (west half), District of Mackenzie, Geol. Surv. Can., Map 1224A.

Geological Survey of Canada, Open File 4, Item 1, Released Nov. 3, 1967.

Green, L.H.
1965: The mineral industry of Yukon Territory and southwestern District of Mackenzie, 1964; Geol. Surv. Can., Paper 65-19, 94 pp.

1966: The mineral industry of Yukon Territory and southwestern District of Mackenzie, 1965; Geol. Surv. Can., Paper 66-31, 137 pp.

Green, L.H., and Godwin, C.I.
1963: Mineral industry of Yukon Territory and southwestern District of Mackenzie, 1962; Geol. Surv. Can., Paper 63-38, 71 pp.

Harris, D.C., and Thorpe, R.I.
1969: New observations on matildite; Can. Mineralogist, vol. 9, Pt. 5, pp. 656-662.

Henderson, J.F.
1944: MacKay Lake, District of Mackenzie; Geol. Surv. Can., Map 738A.

1949: Pitchblende occurrences between Beaverlodge and Hottah Lakes; Geol. Surv. Can., Paper 49-16, 17 pp.

Henderson, J.F., and Brown, I.C.
1948: Preliminary Map, Yellowknife, Northwest Territories; Geol. Surv. Can., Paper 48-17, 6 pp.

Henderson, J.F., and Jolliffe, A.W.
1941: Beaulieu River, District of Mackenzie; Geol. Surv. Can., Map 581A.

Hutchinson, R.W.
1955: Regional zonation of pegmatites near Ross Lake, District of Mackenzie, Northwest Territories; Geol. Surv. Can., Bull. 34, 50 pp.

Irwin, A.B., and Prusti, B.D.
1955: O'Connor Lake (west half), District of Mackenzie; Geol. Surv. Can., Paper 55-9.

Jolliffe, A.W.
1938: Yellowknife Bay-Prosperous Lake Area, Northwest Territories; Geol. Surv. Can., Paper 38-21.

1944: Rare element minerals in pegmatites, Yellowknife-Beaulieu area, Northwest Territories; Geol. Surv. Can., Paper 44-12, 23 pp.

Kidd, D.F.
1936a: Rae-Great Bear Lake (Centre Sheet); Geol. Surv. Can., Map 332A.

1936b: Rae-Great Bear Lake (North Sheet); Geol. Surv. Can., Map 333A.

Lang, A.H.
1952: Canadian deposits of uranium and thorium; Geol. Surv. Can., Econ. Geol. Series No. 16, 173 pp.

Lord, C.S.
1942: Snare River, District of Mackenzie; Geol. Surv. Can., Map 690A.

1951: Mineral Industry of District of Mackenzie, Northwest Territories; Geol. Surv. Can., Mem. 261, 336 pp.

1952: Camsell River, District of Mackenzie; Geol. Surv. Can., Map 1014A.

Mathieu, G.I.
1966: Investigation of a gold-cobalt-bismuth ore from the Marian River area for Precambrian Mining Services Ltd., Yellowknife, N.W.T.; Can. Dept. Energy, Mines and Resources, Mines Branch, Investigation Report IR 66-83.

McGlynn, J.C.
1956: Tumi Lake, Mackenzie District; Geol. Surv. Can., Paper 56-4, 6 pp.

Moore, J.C.G.
1956: Courageous-Matthews Lake area; Geol. Surv. Can., Mem. 283, 52 pp.

Moore, J.C.G., Miller, M.L., and Barnes, F.Q.
1951: Carp Lakes, Northwest Territories; Geol. Surv. Can., Paper 51-8 (map with marginal notes).

Norris, A.W.
1965: Stratigraphy of Middle Devonian and older Paleozoic rocks of the Great Slave Lake region, Northwest Territories; Geol. Surv. Can., Mem. 322, 180 pp.

Norris, D.K., Price, R.A., and Mountjoy, E.W.
1963: Geology northern Yukon Territory and northwestern District of Mackenzie; Geol. Surv. Can., Map 10-1963.

O'Neill, J.J.
1924: The geology of the Arctic Coast of Canada west of the Kent Peninsula; Report of the Canadian Arctic Expedition, 1913-1918, vol. 11 (Geology and Geography), Pt. A, pp. 1-107.

Owens, D.
1967: Mineralogical examination of a lead-zinc ore from Fennix Mines Ltd., Yellowknife, Northwest Territories; Can. Dept. Energy, Mines and Resources, Mines Branch, Investigation Report IR 67-2, 5 pp.

Roed, M.A.
1969: An occurrence of chalcopyrite, Liard River, N.W.T.; Bull. Can. Petrol. Geol., vol. 17, No. 3 (Sept. 1969), pp. 347-353.

Schiller, E.A.
1965: Mineral industry of the Northwest Territories, 1964; Geol. Surv. Can., Paper 65-11, 62 pp.

Schiller, E.A., and Hornbrook, E.G.
1964a: Mineral industry of District of Mackenzie, 1963; Geol. Surv. Can., Paper 64-22, 43 pp.

1964b: A study of gold-bearing amphibolites from the Contwoyto Lake area, North-Central Mackenzie District; in Summary of Activities: Office and Laboratory, 1963, Geol. Surv. Can., Paper 64-2, pp. 86-88.

Stanton, M.S.
1947: Chalco Lake map-area, Northwest Territories; Geol. Surv. Can., Paper 47-18.

Stockwell, C.H.
1936a: Eastern portion of Great Slave Lake (west half), District of Mackenzie; Geol. Surv. Can., Map 377A.

1936b: Eastern portion of Great Slave Lake (east half), District of Mackenzie; Geol. Surv. Can., Map 378A.

Stockwell, C.H., et al.
1968a: Christie Bay, District of Mackenzie; Geol. Surv. Can., Map 1122A.

1968b: Reliance, District of Mackenzie; Geol. Surv. Can., Map 1123A.

Survey of Mines 1968, Montreal, The Financial Post Press.

Tassonyi, E. J.
1969: Subsurface geology, lower Mackenzie River and Anderson River area, District of Mackenzie; Geol. Surv. Can., Paper 68-25, 207 pp.

Thorpe, R. I.
1966: Mineral industry of the Northwest Territories 1965; Geol. Surv. Can., Paper 66-52, 66 pp.

1970: Geological exploration in Coppermine River area, Northwest Territories, 1966-68; Geol. Surv. Can., Paper 70-47.

Thorsteinsson, R., and Tozer, E. T.
1962: Banks, Victoria and Stefansson Islands, Arctic Archipelago; Geol. Surv. Can., Mem. 330, 85 pp.

Thurber, J. B.
1946: Glacier Bay-Cameron Bay area, Great Bear Lake, Northwest Territories; Geol. Surv. Can., Special Report.

Tremblay, L. P.
1967: Contwoyto Lake area (north 1/2), District of Mackenzie; Geol. Surv. Can., Paper 66-28, 19 pp.

Tremblay, L. P., Stanton, M. S., and Yardley, D. H.
1954: Chalco Lake, District of Mackenzie; Geol. Surv. Can., Map 1023 A.

Wright, G. M.
1957: Geological notes on eastern District of Mackenzie, Northwest Territories; Geol. Surv. Can., Paper 56-10, 23 pp.

1967: Geology of the southeastern Barren Grounds, parts of the District of Mackenzie and Keewatin; Geol. Surv. Can., Mem. 350, 91 pp.

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