



GEOLOGICAL  
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DEPARTMENT OF MINES  
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MINERAL INDUSTRY OF YUKON TERRITORY  
AND SOUTHWESTERN DISTRICT OF MACKENZIE,  
1962

L. H. Green and C. I. Godwin



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# MINERAL INDUSTRY OF YUKON TERRITORY AND SOUTHWESTERN DISTRICT OF MACKENZIE, 1962

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## INTRODUCTION

This is the third of a series of papers on developments in the mineral industry of Yukon Territory and the Southwestern District of Mackenzie. Most of the report is based on visits by the technical staff of the Whitehorse Office of the Geological Survey of Canada to active mining properties. Additional information was obtained from personal communications with individuals and companies, press releases and technical papers, and from reports by the Mining Recorders at Dawson, Mayo, Watson Lake, and Whitehorse.

The writers are grateful for the many kindnesses received from the various property owners or their representatives. Thanks are also due to a number of individuals and companies for supplying operational and technical data.

Earlier reports on mining developments in the Yukon are contained in the Annual and Summary Reports of the Geological Survey for the period 1898 to 1933. Many of the original reports are now out of print but most of the information dealing with the Yukon has been compiled by Bostock (1957)<sup>1</sup>. The latter publication is invaluable as a ready reference on many of the early discoveries in the Yukon. Mining developments in the period 1934 to 1940 are described in a series of reports by Bostock (1935, 1936b, 1937, 1938, 1939, and 1941) and 1960 to 1961 in reports by Skinner (1961, 1962).

## MINERAL PRODUCTION OF YUKON

The mineral industry has formed the backbone of the economy of Yukon since the discovery of the Klondike Gold Fields in 1896. The greatest value of mineral production was attained in the year 1900 when over 22 million dollars worth of gold and silver was produced. The value of mineral production dropped below 10 million dollars a few years later and did not rise above this until 1952 when the operations of United Keno Hill Mines Company Limited on Galena and Keno Hills came into full production. The value has subsequently remained in excess of 10 million dollars.

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<sup>1</sup> Names and/or dates in parentheses refer to publications listed in the Selected Bibliography.

Table I

Mineral Production of Yukon Territory<sup>a</sup>

Mineral		1960	1961	1962 <sup>b</sup>	Cumulative Total (1886 to Dec. 31, 1962)
Gold	fine oz.	78,115	66,878	54,086	10,893,899
	\$	2,652,004	2,371,494	2,023,357	253,781,221
Silver	fine oz.	7,217,361	6,937,086	6,581,615	125,698,801
	\$	6,416,956	6,538,897	7,667,581	92,986,830
Lead	lb.	20,286,871	16,769,815	16,252,650	410,242,087
	\$	2,166,638	1,712,198	1,612,263	43,414,150
Zinc	lb.	13,402,899	12,137,418	12,509,000	191,589,601
	\$	1,789,287	1,528,100	1,513,589	25,339,847
Cadmium	lb.	145,496	142,685	140,000	2,116,491
	\$	206,604	228,296	240,800	3,693,729
Copper	lb.		880,773	458,170	14,401,455
	\$		257,098	142,033	3,110,826
Platinum	fine oz.	19			19
	\$	1,553			1,553
Coal	tons	6,470	7,703	7,777	247,022
	\$	97,156	114,221	117,159	2,199,461
TOTAL	\$	13,330,198	12,750,304	13,316,782	424,553,678 <sup>c</sup>

<sup>a</sup>Figures from Dominion Bureau of Statistics (1957; and later releases).

<sup>b</sup>Preliminary figures.

<sup>c</sup>Tungsten and antimony valued at \$26,061 has also been produced and is included in the total.

During 1962, United Keno Hill Mines Limited silver-lead-zinc operation on Galena Hill remained the only large lode producer in the Yukon. In the fiscal year ended September 30, 1962, the company sold concentrates valued at \$9,635,252 before the deduction of smelter charges, freight, and marketing expenses. Two small-lode mining operations were conducted: Dominion Explorers produced 1,062 tons of copper ore from the Bornite Creek deposit near Sockeye Lake in Dezadeash map-area; and A.A. Smith mined about 14.8 tons of high-grade silver-lead ore from the Formo property on Galena Hill. Yukon

Coal Company at Carmacks produced 7,650 tons of coal.

The Yukon Consolidated Gold Corporation Limited, the largest placer producer in the Yukon, operated five dredges and two bulldozer-slucing plants in the Klondike area, and produced 42,617 ounces of fine gold and 8,984 ounces of silver valued at \$1,512,511. Other small-scale placer operations throughout the Yukon produced approximately 16,573 ounces of crude gold. Table II, which consists of information supplied by operators and by Mining Recorders' reports, gives approximate 1962 production of placer gold by areas in the Yukon.

Table II  
Yukon Placer Gold Production, 1962

District	Number of Operators	Approximate Production of Crude Gold (ounces)
Klondike: Y.C.G.C.*	1	42,617**
Others	18	9,902
Sixtymile	1	150
Kirkman Creek	1	561
Clear Creek	1	500
Mayo	9	3,639
Kluane Lake	2	1,786
Carmacks	1	35
<b>Totals</b>	<b>34</b>	<b>59,190</b>

\* The Yukon Consolidated Gold Corporation, Limited.

\*\*  
Fine gold.

#### EXPLORATION IN YUKON

The year was an extremely active one, with a large number of companies and individuals engaged in exploration. Operations carried out included: prospecting by individuals and large helicopter-supported parties, geophysical and geochemical investigations, underground operations, diamond drilling, and property



examinations. Helicopter transport played an increasingly important role in exploration and has made it possible for operations to be extended into areas formerly considered virtually inaccessible. During the past two years, and especially in 1962, the availability of helicopters on an hourly or daily basis from many points within the Yukon enabled even small operations to take advantage of this form of transportation.

The highlight of the 1962 season was the staking of the Snake River iron deposit, approximately 140 miles northeast of Mayo, by Crest Exploration Limited, a subsidiary of the California Standard Company. A brief summary of some of the other more important exploration activity follows. In the Galena and Keno Hills and Haggart Creek areas, a number of companies explored for silver-lead-zinc deposits. In the Carmacks area, Ormsby Mines Limited drove an adit, which intersected the gold-bearing structure of the Laforma property at depth and the Mount Nansen Exploration Syndicate stripped and drilled a promising gold-silver discovery. In the Watson Lake area, Frances River Syndicate reported the discovery of a promising lead-zinc showing in an area not previously known to contain mineralization. In the Pelly Mountain area, Tintina Silver Mines Limited met with discouraging results in the exploration of their silver-lead-zinc property. In the Quiet Lake area, Conwest Exploration Company Limited announced the discovery of a molybdenum showing late in the 1962 field season.

Table III

Mineral Claims Recorded, Yukon Territory

(Figures supplied by Department of Northern Affairs and National Resources)

Mining District	1959	1960	1961	1962
Dawson	85	244	202	135
Mayo	71	165	618	1269
Watson Lake*				758
Whitehorse	521	928	1642	1002
Total	677	1337	2462	3164

\* District established April 27th, 1962.

MINERAL PRODUCTION AND EXPLORATION,  
NAHANNI MINING DISTRICT, DISTRICT OF MACKENZIE

The Nahanni Mining District was established in the District of Mackenzie as of April 27, 1962. The Mining Recorder's office for the new district is located at Watson Lake, Yukon. Thirty-six mineral claims were recorded in the Nahanni Mining District in 1962.

Within the district, in the Flat River area, Canada Tungsten Mining Corporation Limited constructed a mill and townsite and mined approximately 85,000 tons of tungsten ore from an open-cut. Sample shipments of high-grade tungsten concentrates were made early in 1963. Redstone Mines Limited continued exploration of their prospecting permits in the Mackenzie Mountains. During 1962, they discovered what appears to be a bedded copper deposit within the permit areas.

LODE MINING AND EXPLORATION

MAYO MINING DISTRICT

GALENA AND KENO HILLS AREA

United Keno Hill Mines Limited (about 63°54'N, 135°29'W)

Selected References: Boyle (1956, 1957); Green and McTaggart (1960); McTaggart (1960); United Keno Hill Mines Limited (1961; 1962); Kindle (1962); Skinner (1961, pp. 21-25; 1962, pp. 22-27).

United Keno Hill Mines Limited is Canada's leading producer of silver, and operates the only large-scale lode mines in the Yukon. The gross value of the production for the fiscal year ending September 30, 1962, was \$9,635,252 and the total value of the production since 1947 is \$110,858,532. In recent years the value of production has far exceeded other industries, and directly and indirectly the Company supports much of the economy of the Yukon.

Keno Hill Mining Company Limited was formed in 1945 to take over a number of properties in the district, including those of the Treadwell Yukon Corporation Limited. In 1948, the capitalization of the company was altered and the name changed to United Keno Hill Mines Limited. As of September 30, 1962, the latter company owned 641 mineral claims, all located in the Galena Hill-Keno Hill area. Employees at this date totalled 600 in the Elsa-Calumet area, plus a number employed elsewhere in the Yukon.

The company's principal properties are accessible by all-weather roads. Concentrates, totalling 25,953 tons in the 1962 fiscal year, are trucked 290 miles to Whitehorse, Yukon, from whence they are trans-shipped to Vancouver, B.C., via railway and coastal steamer. Freight from Whitehorse, and coal from the Yukon Coal Company Limited mine at Carmacks are handled on the return haul.

The first discovery in the camp was the Silver King property in 1906, but lode mining did not begin until 1913. Interest in the camp increased following the discovery of the No. 9 vein on Keno Hill in 1919 and with a few interruptions (notably between 1942 and 1946), there has been almost continuous production.

During the fiscal year ending September 30, 1962, the production came from the Hector, Calumet, and Elsa mines with minor development ore from the Keno, Silver King, and Galkeno properties. The following summary of operating results is taken from the Annual Reports of the Company:

	12-Month Period Ended Sept. 30th		
	1962	1961	1960
Dry tons milled	184,123	186,116	176,745
Daily milling rate in tons	504.4	509.5	482.9
Mill heads:			
Silver (oz./ton)	40.55	41.16	43.35
Lead (%)	5.84	5.83	7.25
Zinc (%)	4.42	4.84	4.80
Metal production			
Silver (oz.)	7,000,837	7,231,908	7,249,101
Lead (lb.)	17,587,767	17,911,672	21,986,887
Zinc (lb.)	13,885,884	15,512,624	14,440,774
Cadmium (lb.)	184,364	202,432	181,132
Metal sales <sup>a</sup>	\$9,635,252	\$8,540,143	\$8,793,284
Source of ore treated in mill			
Hector mine (%)	8.98	12.26	20.94
Calumet mine (%)	63.03	65.86	58.73
Elsa mine (%)	20.20	19.09	19.32
Keno mine (development) (%)	5.87	0.71	0.51
Silver King mine (development) (%)	1.84	1.85	-
Galkeno mine (development) (%)	0.08	0.23	0.36
Dumps (%)	-	-	0.14
Ore Reserves			
Tons <sup>b</sup>	445,630	514,369	512,577
Silver (oz./ton)	38.41	38.47	38.39
Lead (%)	7.12	6.78	6.36
Zinc (%)	5.08	4.95	4.84

<sup>a</sup>Without deductions for smelter charges, freight and marketing expenses.

<sup>b</sup>Exclusive of the Onek property with reserves of 123,491 tons averaging 10.27 oz. silver per ton, 4.4% lead and 13% zinc.

The principal production of the camp is won from erratic ore shoots developed along vein faults. As a result, a great deal of exploratory work is required. During the fiscal year ending September 30, 1962, this consisted of a total of 13,841 feet of drifting and crosscutting, 4,791 feet of raising, 215 feet of shaft sinking, 10,581 feet of underground diamond drilling and 3,871 feet of surface diamond drilling. In addition, geophysical surveys and soil sampling were carried out over part of the company's ground. An even more extensive program (Northern Miner, Jan. 10, 1963) costing \$1,000,000 has been planned for the coming year. It calls for 30,000 feet of underground development and a substantial program of surface exploration, including soil sampling, geochemical and geophysical surveys, and surface diamond drilling.

At the Hector and Calumet mines (United Keno Hill Mines Limited, 1961) production has come from numerous ore shoots developed in a branching and joining vein system, which has been explored to the 1,165 foot level by means of an internal shaft. The various vein structures are referred to by numbers. The general strike of the vein system is N45°E and the dip 65°SE. Three major cross-faults striking northwest and dipping 45°SW cut and displace the vein systems. Development work during the fiscal year at the Hector mine, concentrated mainly on the 23 vein system on the 400 and 650 levels, consisted of 586 feet of drifting and crosscutting, and 193 feet of raising. Work at the Calumet mine, mainly on the 18-19 vein system between the 650 and 900 levels, consisted of 6,919 feet of drifting and crosscutting, and 2,594 feet of raising. Development of the 23 vein on the 400 and 650 levels also commenced.

The veins at the Elsa mine (United Keno Hill Mines Limited, 1961) are more complex, but the larger ore shoots occur near the junction of the 5 vein, which strikes northeast and dips steeply southeast and the 15 vein, which strikes north-northeast and dips gently west. Mineralization differs from that at the Hector and Calumet mines in that at the Elsa mine freibergite is more abundant, galena is less common, and sphalerite virtually lacking. The vein system at the Elsa mine has been traced for 2,300 feet between two cross-faults. During the past year, 2,781 feet of drifting and crosscutting and 567 feet of raising produced only one ore shoot.

The Keno property, near Keno Summit, contains a number of longitudinal and transverse vein faults (Boyle, 1956, Figs. 2 and 7). Three parallel longitudinal vein faults strike east-northeast and dip steeply south. From north to south they are referred to as the Main Break (Fault), the No. 6, and the Porcupine. Numerous transverse vein faults that strike northeast and dip steeply southeast occur between the Main Break and the No. 6 longitudinal faults. Keno Hill Limited, a former operator, did limited work on three of these transverse veins and United Keno Hill Mines Limited have concentrated on the No. 9 transverse vein for the past five years. A camp has been built on the south slope of Keno Hill and most of the recent work has been done from two levels driven on this face of the hill. The most recent, the

700 level, was driven at an elevation of 4,800 feet above sea level to investigate the Porcupine, No. 6, and No. 9 vein faults. These workings have been connected underground to the 200 level, which was driven a few years earlier on the same face of the hill to the upper part of the No. 6 and No. 9 vein faults. Development work has been done on a number of intermediate underground levels. In 1961, crosscutting and drifting on the No. 9 vein fault developed an ore length of 291 feet, averaging 38.36 ounces of silver per ton over a width of 6.2 feet on the 450 level and 92 feet averaging 58.55 ounces of silver per ton over a width of 5.6 feet on the 575 level. In 1962, 1,490 feet of lateral work and 1,041 feet of raising was completed on the No. 9 vein fault. The lateral work opened up ore shoots totalling 202 feet averaging 39.0 ounces of silver per ton over a width of 5.4 feet and the raising established the continuity of the No. 9 vein fault between the 700 and 300 levels.

The Galkeno mine, originally developed as the Mackeno mine (Boyle, 1957), was purchased by United Keno Hill Mines in 1958. The 900 adit, commenced by the former owners in an attempt to drain the higher workings, has been continued intermittently since this time, although serious delays have resulted from heavy water flows and ice. A further 441 feet were driven during the year ending September 30, 1962, for a total of 3,818 feet. A limited amount of rehabilitation and development was done in the old workings above the 300 level.

The Silver King Mine (Boyle, 1957) was dewatered commencing in the summer of 1960 and exploration has been carried on since. In 1962, 1,440 feet of drifting and crosscutting and 396 feet of raising were carried out on the No. 1 (204 of Boyle) vein fault on the 200 and 300 levels. A short ore shoot, 75 feet in length, was developed under the old Aitken shaft area beneath Galena Creek.

On the No Cash vein (Boyle, 1957) 215 feet of sinking was carried out to complete the winze between the 100 and 225 levels. Drifting on the 225 level was started at the year end.

The Comstock Keno Mines Limited group of 10 claims (Skinner, 1962, p. 27) on Keno Hill was leased by the Company. Work consisted of rehabilitation of old workings and the start of a shaft-sinking program.

#### Galena Hill and South McQuesten River Valley

Silver Titan Mines Limited (63°55'N, 135°41'W)

References: McTaggart (1960); Skinner (1961, p. 32); Western Miner and Oil Review (Dec. 1962, p. 54); Northern Miner (Dec. 20, 1962, p. 19).

Silver Titan Mines Limited commenced exploration in 1962 on their Galena Hill property, which lies on the projected extension

of the massive quartzite member (unit 1 - McTaggart, 1960) found to the east. Holdings of the company in December 1962, were 99 claims on the Galena Hill property, and 221 claims on the northern side of the South McQuesten River, referred to as the Northlimb property. Both of the above properties are heavily drift-covered except for parts of the Northlimb property. A maximum of 12 men worked from a base camp near the Silver King Mine. Late in the 1962 season, the company also undertook a joint project with Peso Silver Mines Limited, on the Duncan property on Keno Hill (see Duncan Group, Galena and Keno Hill area).

On the Galena Hill property, mainly adjacent to and north of the Mayo-Elsa road, exploration included a Turam electromagnetic survey, which was followed up by diamond drilling. Ten holes with a total length of 2,450 feet were drilled. In a notice to shareholders, December 7, 1962, (as reported in Western Miner and Oil Review, Dec. 1962, p. 54) this work proved the existence of several parallel and branching vein-fault structures. In addition to this, the Gerlitzki vein was stripped for a length of about 400 feet. The vein-fault strikes N35°E and dips about 55°SE. When visited late in July the mineralization exposed in the trench was mainly dark brown sphalerite and pyrite, although some disseminated galena was exposed in the footwall. A grab sample of this sulphide, assayed by Mineral Sciences Division, Mines Branch, Department of Mines and Technical Surveys, gave 6.50 per cent lead, 4.95 per cent zinc, and 14.675 ounces of silver per ton.

On the Shanghai claim group of the Northlimb property, limited bulldozer trenching was done in October 1962. As reported in the Northern Miner (Dec. 20, 1962, p. 19) two faults were found in highly fractured quartzite and an oxidized zone a few inches wide in one of these faults yielded a grab sample, which assayed 1.1 ozs. gold and 790.5 ozs. silver per ton with 10.4 per cent copper and 0.4 per cent lead.

#### Galena Hill and Haggart Creek

Rio Plata Silver Mines Limited (64°00'N, 135°52'W)

References: Canadian Mining Journal (Sept. 1962, p. 126);  
Northern Miner (Sept. 6, and Dec. 20, 1962).

Rio Plata Silver Mines Limited, incorporated in 1962, holds 54 claims on Haggart Creek immediately to the east of Peso Silver Mines Limited. During the season, the company is reported to have conducted a Turam electromagnetic survey on this ground, and to have carried out bulldozer trenching, which uncovered a narrow vein carrying high silver values and an arsenopyrite vein containing free gold. In addition, the company optioned and did some work on John Strebchuk's Alberta claims west of Silver Titan Mines Limited. On December 14, 1962, the shareholders of Yukeno Mines Limited approved a proposal to sell the Formo group (see description of Formo

property) and other properties in the district to Rio Plata Mines Limited.

### Galena Hill

#### Formo Property (63°56'N, 135°22'W)

References: Boyle (1957, pp. 21-22); Skinner (1962, p. 27); Northern Miner (Dec. 20, 1962).

The Formo property of 15 claims is on the north slope of Galena Hill beside the Elsa-Keno road. In 1961, the group was leased to A. A. Smith of Mayo, Yukon, by Yukeno Mines Limited. At that time, Smith also held 6 claims in the vicinity. Rio Plata Silver Mines Limited subsequently acquired Smith's claims and late in 1962 (Northern Miner, Dec. 20, 1962) the shareholders of Yukeno Mines Limited approved a proposal to sell the Formo group and other properties in the district to the same company.

During the winter of 1961-62, Smith sank a short shaft near the original Formo shaft and mined about 14.8 tons of hand-sorted ore that assayed 144.6 ounces of silver per ton, 57.0 per cent lead, and 10.3 per cent zinc. Later in 1962, he did a considerable amount of bulldozer stripping on both the Formo group and his own ground.

When the writers visited the property in October, 1962, a wide fault-zone trending about N30°E and dipping about 50°E had been exposed for about 70 feet along trend by stripping near the original Formo shaft. Near the shaft, the fault brings graphitic quartz-mica schist on the east side into contact with greenstone on the west side. The latter is probably over 20 feet thick. A lens of massive galena, 12 to 16 inches wide, was exposed in trenches in the schist near the foot-wall of the fault-zone. Smith's underground workings have been destroyed by later stripping, but he reports that the ore mined occurred about 20 feet towards the hanging-wall from the mineralized zone exposed at the time of the visit.

About 150 feet up the slope, stripping has exposed a narrow fault-zone trending N20°E and dipping 56°E in which a small wedge of altered greenstone on the east side is brought into contact with graphitic quartz-mica schist on the west. The greenstone is underlain by schist similar to that in the foot-wall. Approximately 1,500 feet farther up the hill and 150 feet higher in elevation, stripping has exposed talus of vein quartz with siderite and sphalerite. The upper cut is roughly on line with the fault zone exposed near the Formo shaft, but stripping in the soft graphitic quartz-mica schist between the two did not expose the fault and probably did not reach undisturbed bedrock.

Keno Hill

Vanguard Group ( $63^{\circ}55\frac{1}{2}'N$ ,  $135^{\circ}13\frac{1}{2}'W$ )

Reference: Boyle (1956, p. 25)

The group is located on the south slope of Keno Hill, just west of Charity Gulch, at an elevation of about 4,400 feet, and is reached from the road to Keno Summit. C. Wann, of Whitehorse, Yukon, optioned the Vanguard group of 6 claims from A. Smith and A. Nichol in late 1962. Wann also holds a half interest in the adjoining Montana claim.

A series of pits containing some siderite indicate that a northeast-trending vein fault can be traced for about 600 feet across part of the Montana and Vanguard claims. Talus and scattered outcrops indicate that the bedrock is massive blue-grey quartzite, typical of Keno and Galena Hills. Some mining has been done from a small shaft about 35 feet in depth on the Vanguard group. A shipment of hand-sorted ore made in 1948 consisted of 28.86 tons that assayed 311.1 ounces of silver per ton and 51.8 per cent lead; another shipment in 1949 consisted of 6.25 tons that assayed 235.9 ounces of silver per ton, 51.5 per cent lead, and 0.5 per cent zinc.

Late in 1962, Wann built a small camp and collared an adit about 70 feet vertically beneath the collar of the shaft. When the writers visited the property in late February 1963, a main drift had been driven about 230 feet on a bearing of about 285 degrees azimuth, and a side drift on a bearing of about 255 degrees azimuth had been started 145 feet from the portal. The main drift passes beneath the collar of the shaft, but the vein fault was not encountered in the underground workings. Rocks exposed in the underground work are massive to thin-bedded blue-grey quartzite with a minor amount of graphitic quartz-mica schist. They strike east and dip gently south following the regional trend on Keno Hill. They are highly foliated and appear to have undergone considerable movement parallel to the bedding. A number of isoclinal folds with limbs lying in the plane of the bedding and axes trending about east were observed. Numerous faults lying close to the bedding were observed underground and it appears probable that the vein fault has been displaced along these faults.

Duncan Group ( $63^{\circ}57\frac{1}{2}'N$ ,  $135^{\circ}15\frac{1}{2}'W$ )

References: Boyle (1956, p. 18); Skinner (1961, p. 32);  
Aho (1962); Western Miner and Oil Review (Dec. 1962, p. 54).

During 1962, Peso Silver Mines Limited and Silver Titan Mines Limited, in equal partnership, optioned and explored the Duncan group of 5 fractional claims owned by A.C. Duncan of Vancouver, B.C. The group is located near Gambler Gulch on the north slope of Keno Hill at an altitude of about 4,000 feet and is reached



by the road that passes through the abandoned mining camp of Wernecke.

When the writers visited the property early in October, 1962, stripping on the Ivan claim had exposed a mineralized vein fault for about 65 feet. The fault trended about N40°E and dipped steeply southeast. Throughout most of the exposed length the fault was in graphitic quartz-mica phyllite, but one cut exposed altered greenstone for about 25 feet in the foot-wall. The mineralized zone exposed was up to 2 feet wide and consisted of galena and siderite with lesser amounts of pyrite, tetrahedrite, and chalcopyrite. High silver values are reported from the vein (Aho, 1962), the best being 400 ounces of silver per ton across a width of 4 feet.

Later in the season (Western Miner and Oil Review, Dec. 1962, p. 54) an adit, 91.5 feet in length, was put in beneath the open cut.

The vein on the Duncan group and two vein faults on the adjacent Lake property are on the same trend and may be a continuation of the Ladue-Sadie-Friendship vein fault system to the southwest (Boyle, 1956, p. 18). The closest known orebody on this system was at the Ladue mine, about 3,300 feet to the southwest of Duncan group. Northeast of the Ladue mine, the vein fault passed into relatively incompetent graphitic schists and only limited success was met with in tracing the assumed extension (Boyle, 1956). However, if the vein fault does continue it might be expected to be better developed where it cuts more competent schists or greenstone.

#### HAGGART AND SECRET CREEKS AREA

Peso Silver Mines Limited (64°00'N, 135°57'W)

References: MacLean (1914, pp. 153-157); Skinner (1961, pp. 32-33; 1962, pp. 31-34); Green and Roddick (1962); Canadian Mining Journal (Jan. 1963, p. 85); Northern Miner (Jan. 24, 1963).

Peso Silver Mines Limited owns 234 claims in the Haggart and Secret Creek area. Thirty-two of these claims are on Iron Rust Creek, 94 cover the former Barker Estate, and 108 cover the Peso and Rex groups. The property, 26 miles by road from the Proctor sawmill on the Mayo-Elsa road, is reached by a branch road, 5 miles in length, which leaves the Haggart Creek road and follows the valley of Secret Creek.

The Peso property was originally staked in 1910. Peso Silver Mines Limited, incorporated in 1961, acquired the Peso and Rex groups from Tanar Gold Mines Limited. Late in 1961, the company erected a camp at an altitude of 3,550 feet, near the Peso No. 1 showing.

Exploration carried out during 1962 consisted mainly of underground work on the Peso No. 1 vein and stripping and geophysical work on the Peso and Rex groups. A maximum of 20 men were employed during the season. Late in the 1962 season, the company also undertook a joint project with Silver Titan Mines Limited, on the Duncan property on Keno Hill (see Duncan group, Galena and Keno Hills area).

The Peso-Rex area is characterized by well-rounded topography. Ice has covered the area to an elevation of at least 3,800 feet, but has not removed the mantle of residual overburden. There are few natural exposures and the veins are deeply weathered. Float, however, has not been transported far and its examination gives an idea of the underlying rocks and mineralization. Showings are exposed at elevations ranging from 3,500 feet to 4,300 feet. The property is underlain by brown-weathering, grey to greenish grey phyllite, and graphitic and chloritic schists (unit 3—Green and Roddick, 1962). Sill-like occurrences of quartz porphyry outcrop immediately to the north of the showings on the Peso group. Granitic rocks are found about 4 miles to the northeast near Dublin Gulch.

The underground workings on the Peso No. 1 vein are on the 3,350 level, about 110 to 160 feet below the surface exposure of the vein. The adit is about 361 feet long at about 110 degrees azimuth and intersects the vein between 302 and 326 feet from the portal. Drifting was extended about 70 feet to the southwest and 520 feet to the northeast subparallel to the vein fault. A number of short crosscuts were made through the vein fault in order to sample it. By February, 1963, a total of about 1,250 feet of drifting on the Number 1 vein had been completed.

Rocks exposed underground are very contorted. Quartzites are strongly lineated and are frequently isoclinally folded in many places, with limbs parallel to the dominant foliation or bedding(?). Phyllitic rocks locally have strong wrinkle lineations. Graphitic and chloritic shears are common. Faults are abundant and several post-mineralization faults appear to displace the vein for short distances. The mineral zone, in general, follows a zone consisting of several breaks that trend about N45°E and dip 65°NW; narrow intervening sections strike about N80°E and dip 45°N.

The degree of alteration is variable, ranging from unaltered sulphides to completely oxidized material. Minerals observed underground include: (1) leek-green scorodite; (2) earthy, yellow to brown bindheimite; (3) earthy, brown goethite; (4) metallic, white arsenopyrite; (5) brassy cubes of pyrite; (6) metallic, black, needlelike masses of jamesonite; (7) light brown siderite; (8) metallic, black argentian tetrahedrite (freibergite); (9) brownish jarosite(?); (10) green chalcantite crystals on the walls of the adit, which have crystallized from copper-bearing groundwater.

The assays and descriptions of the following three samples give an idea of the mineralization in the No. 1 vein.

Sample No.	Bi %	Pb %	Zn %	Cu %	Cd %	Sb %	As %	Ag oz/ton	Au oz/ton
1	0.12	1.54	0.28	1.34	n.d.	0.50	3.37	9.489	0.01
2	0.01	6.90	0.02	0.040	0.05	4.91	4.90	36.083	0.04
3	0.05	0.82	0.05	0.20	n.d.	0.59	2.16	3.30	0.01

(Assays by Mineral Sciences Division, Mines Branch, Department of Mines and Technical Surveys)

Sample Number 1: from the intersection of the vein and adit; sample width 15 feet. Specimens from this locality are predominantly siderite, but some quartz is also present. Jamesonite is readily identified by its soft, needlelike character. Arsenopyrite and freibergite are disseminated throughout the specimens. Vugs are common and are frequently lined with small crystals of dark-brown-stained siderite. Buff clay-like minerals are concentrated in some of the vuggy parts of the specimens.

Sample Number 2: from a short crosscut that is about 60 feet northeast of the adit; sample width 15 feet. Specimens are predominantly brown, green, and grey clay-like minerals. The green mineral is wholly composed of minute crystals of scorodite; the brown mineral is probably goethite; the grey material is graphitic. Jarosite is possibly responsible for some of the silver content.

Sample Number 3: from a short crosscut about 180 feet northeast of the adit; sample width 9 feet. Specimens are variable, but are generally either white vein quartz with pyrite stringers along small fractures, or silicified quartzite in which pyrite, jamesonite, and white quartz fill the fractures.

Surface trenching by the company during 1962 was mainly on the Nos. 3, 4, and 5 veins. A Turam electromagnetic survey was also done on the group in 1962. In the surface showings, the No. 1 vein is weathered to brown, yellow, and green oxides. A weighted average of 12 sample sections of this material, taken 10 feet apart along a 120-foot length of the vein averaged 19 ounces of silver a ton over an average width of 5 feet (Aho, personal communication). The other veins on the Peso group are similar in appearance, but jamesonite is found in some of the other surface showings. Trenching has indicated that the vein faults are fairly continuous. The Number 2 vein, for example, appears to have a length of about 1,700 feet.

The showing on the Rex group is about 2 1/2 miles east-southeast of the portal on the Number 1 vein and is at an altitude of about 3,850 feet. In June 1962, the vein was traceable for about 1,500 feet across 12 bulldozer cuts. The vein strikes about N80°E and dips about 55°N.

The vein is an irregularly mineralized fault-gouge zone in which oxidation has been extensive and irregular. Mineralization is similar to that of the Peso Number 1 vein but galena, sphalerite, and siderite are more abundant; pyrite is less abundant and arsenopyrite is absent. Other exploration on the group included a Turam survey, more stripping, sampling, and mapping, and diamond drilling. Stripping was done continuously along the length of the vein. Sixteen diamond-drill holes with a total length of 2,870 feet and a core recovery of 80 per cent indicated the vein had an approximate width of 7 feet to a depth of between 250 and 300 feet (Canadian Mining Journal, Jan. 1963). Late in 1962, a portal site was collared at the 3,700 foot level and an adit was driven 37 feet before the winter shutdown on the Rex group.

Mayo Silver Mines Limited (64°05'N, 135°40'W)

References: Northern Miner (June 28, and Sept. 6, 1962);  
Engineering and Mining Journal (Nov. 1962, p. 146).

Mayo Silver Mines Limited, incorporated in 1962, holds 366 claims in the area north and east of Dublin Gulch. During the season, the company is reported to have built 15 miles of access road to silver-lead-antimony showings on Lime and Eightmile Creeks and to have discovered two gold- and arsenopyrite-bearing quartz veins in the Potato Hills area.

SNAKE RIVER AREA

Crest Exploration Limited (approx. 65°15'N, 133°00'W)

Early in the summer of 1962, Crest Exploration Limited, a wholly-owned subsidiary of the California Standard Company, staked a major sedimentary iron deposit in the Snake River area. During the 1962 season, access to the property was by float-equipped aircraft and helicopter. The nearest lake (65°28'N, 133°48'W) suitable for use by fixed-wing aircraft is some 20 miles northwest of the staked area.

The company holds 493 claims in the Yukon and an additional 369 claims in the Mackenzie Mining District of the Northwest Territories. The Yukon claims, staked as iron claims as defined by the Yukon Quartz Mining Act, are approximately three times the area of the standard mineral claim. A party of up to 50 men was employed in the staking in late winter and early spring. Knowledge of the staking did not become public until G. G. L. Henderson, who had been appointed an Emergency Mining Recorder under the terms of the Yukon Quartz Mining Act, delivered 464 claim applications to the Mining Recorder at Mayo, Yukon, on June 25, 1962. During the remainder of the field season, a smaller party of approximately 15 men carried out further geological mapping and systematic sampling of the deposit. In addition, one diamond-drill hole was put down near 65°14'N, 132°56'W, where

the iron-formation lies at a shallow depth beneath the valley floor.

In the fall of 1962, Crest Exploration retained Canadian Bechtel Limited to do a feasibility study of the deposit, covering mining, beneficiation, transportation to tidewater, and marketing.

The iron-formation, composed essentially of hematite and jasper, is up to 400 feet thick. It occurs near the base of a thick sequence of conglomeratic mudstone, which is about 3,000 feet thick within the staked area. The unit thickens to the west and in the Rapitan Creek area, some 10 miles southwest of the staked area, was considered tuffaceous and referred to as the Rapitan Volcanics by oil company geologists. The name Rapitan Group will be used in this report.

In the staked area, the basal conglomerate of the Rapitan Group rests with slight angular discordance on a sequence of buff, orange, and grey-weathering shale and a carbonate. The latter may correlate with the MacDougal Group, of probable Cambrian age, described by Hume (1954) near Norman Wells in the District of Mackenzie. The Rapitan Group is overlain with angular unconformity by a thick sequence of massive grey-weathering carbonate. The base of the carbonates is marked by a thin orange band, which at one point consists of approximately 30 feet of alternating bands of thin carbonate and conglomerate. Fossils of Ordovician and Silurian age were collected from what is believed to be similar carbonate to the southwest (Green and Roddick, 1962). If the suggested correlations are correct the Rapitan Group is probably of Cambrian age. However, fossils are lacking in the underlying rocks correlated with the MacDougal Group and, in the senior author's opinion, these rocks may correlate with rocks to the west, which are believed to be Precambrian (Green and Roddick, 1962). In any case, the Rapitan Group appears to be of either late Precambrian or Cambrian age.

The main structures of the area are open, northwest-trending folds with gentle dips. Superimposed on these are west- and northwest-trending thrust faults. Locally, steep dips are associated with both folds and faults.

The following section was roughly measured through the Rapitan Group, including the iron-formation, near 65°12'N, 133°09'W:

Top	Thickness in feet	
	Unit	Total from base
Dark maroon weathering, conglomeratic mudstone. About 10 per cent pebbles with most less than 1 1/2 inches, but some to 3 inches in diameter .....	750*	2787*

Top	Thickness in feet	
	Unit	Total from base
Maroon, with some green, conglomeratic mudstone, cross-bedding locally very apparent; a few beds of conglomerate .....	1800*	2037*
Red, iron-rich(?) mudstone .....	100*	237*
<u>Iron-Formation</u> (125 feet)		
Mainly maroon mudstone, with about 10 per cent jasper-rich conglomerate, occurring in beds to 6 inches. Jasper in angular fragments, generally less than 1 inch, but some 6 inches in diameter .....	10	137
Mainly fine hematite, in fairly pure beds to 3 inches, and in beds to 6 inches containing scattered lenses of jasper elongated to 1 inch. A few jasper-rich beds to 3 inches .....	17	
About half, brown-weathering limy material, the remainder about equal amounts of jasper and hematite with some limy material .....	3	
About one-third pure hematite, one-third hematite with jasper nodules to 1 1/2 inches, one-third jasper bands to 2 inches. Contains a few beds to 1 foot thick, but most are 4 inches or less. A 9-inch band of silty material occurs near the base ....	7	
Maroon weathering mudstone without hematite or jasper .....	3	
Mixed jasper and hematite; about one-third hematite in bands to 3 inches, one-third hematite with jasper nodules, and one-third pure jasper with a few beds to 6 inches thick, but most less than 2 inches .....	13	
Brown-weathering siltstone, poorly exposed .....	4	
About one-half jasper occurring in beds to 3 inches thick, and also as a large lens about 3 feet by 7 feet interbedded with hematite bands to 4 inches thick containing some jasper nodules .....	13	

Top	Thickness in feet	
	Unit	Total from base
Hematite-cemented jasper conglomerate, which grades upward into a maroon pebbly mudstone, the latter in sharp contact with an overlying jasper band .....	8	
Hematite; and hematite with jasper nodules; bands about 3 inches thick near the base and thickening upwards .....	40	
Silty material with jasper bands and some hematite-cemented material .....	7	
Covered .....	12	12
Base of section. Underlying beds maroon silty mudstone.		

\*Approximate only.

Where it was observed, the iron-formation consisted of unaltered fine-grained hematite and jasper with a few interbands of maroon silty mudstone similar to the remainder of the Rapitan Group. No leached or weathered material is known. No assays are available, but, in the senior author's opinion, the iron-formation, exclusive of mudstone interbands, may approach a 50 per cent iron content.

With the exception of the periphery, most of the area staked is underlain by the iron-formation and the total reserves of the deposit probably exceed 30 billion tons of iron-formation. Much of this has a considerable depth of cover but large tonnages, at least 5 billion and perhaps as much as 10 billion, are exposed at or near the surface in some of the wider valleys.

Rocks of the Rapitan Group, with or without the iron-formation, may outcrop beneath the late Cambrian or younger (?) unconformity both to the west and southeast of the Snake River area. To the west, the younger carbonates generally rest on rocks considered to be of Precambrian age (Green and Roddick, 1962) but along the Tatonduk River, just west of the Yukon-Alaska boundary, Mertie (1932, pp. 369-392) has described ferruginous rocks, which may be equivalent to the Rapitan Group. To the southeast, rocks of the Rapitan Group, including some iron-formation, outcrop around Little Dal Lake (62°42'N, 126°41'W) and may occur intermittently between the latter point and the Snake River area.

## MACMILLAN PASS AREA

### Southwest Potash Corporation Tungsten Showing (63°17'N, 130°10'W)

In October 1962, 48 claims, partly in the Mayo Mining District and partly in the Mackenzie Mining District (Northwest Territories), were recorded for Southwest Potash Corporation, a wholly-owned subsidiary of American Metal Climax Incorporated. The claims are about 5 miles northwest of MacMillan Pass on the abandoned part of the Canol Road. Mineralization is reported to consist of disseminated scheelite and molybdenite developed in a skarn near the contact of a small granitic stock. Some molybdenite also occurs in quartz veins in the granitic rocks.

## DAWSON MINING DISTRICT

### KLONDIKE AREA

#### Eldorado and Bonanza Creeks

### Klondike Lode Gold Mines Limited (63°54'N, 139°18'W)

References: Skinner (1961, pp. 31-32; 1962, pp. 30-31)

Klondike Lode Gold Mines Limited was incorporated in 1960 to explore for lode gold deposits in the area between Bonanza and Eldorado Creeks. The original placer claims of this area were the richest of the Klondike Gold Fields, but despite many years of prospecting only a very limited amount of gold-bearing bedrock has been discovered. As of May 1962, the company held 152 full and fractional mineral claims in the area.

Exploration carried out by the company in 1960 and 1961 consisted of an extensive program of bulldozer stripping and both diamond and churn drilling. In 1962, 5 diamond-drill holes with a total length of 638 feet were put in across Eldorado Creek at the mouth of French Gulch and a single hole with a length of 142 feet was drilled at the mouth of Gay Gulch, also on Eldorado Creek. The depth of overburden and the physical characteristics of the contorted quartz-muscovite-chlorite schist bedrock made drilling difficult. Low values were obtained from some of the limited amount of core recovered.



FIFTEENMILE RIVER AREA

Silver City

Silver City Property (64°19'N, 139°50'W)

Reference: Cockfield (1928, pp. 8A-10A)\*

J. Risco of Dawson, Yukon, owns seven claims in the Silver City area on the right limit of the Yukon River, at the bend below the mouth of Fifteenmile River, 22 miles northwest of Dawson. L. Patnode of Whitehorse and W. Kaufman of Dawson optioned the property late in the 1962 season and during March 1963 staked an additional 39 claims in the area. A maximum of 3 men were employed during the winter of 1962-63.

The area carries silver-lead and antimony occurrences. Cockfield (1928) reported a 5-ton shipment of hand-sorted material from float on the beach. Country rock consists of crumpled, chloritic and quartz sericite schists, and shattered greenstones (unit D - Green and Roddick, 1962). The deformation of the country rock may be due to structures related to the Tintina Trench, only 3 miles to the northeast.

By October 1962 an adit 3 feet wide by 5 feet high and about 200 feet long had been driven almost due north into the talus about 300 feet above the river in an attempt to locate a sulphide vein that J. Risco reported he had intersected in 1929. Bedrock was encountered 90 feet from the portal. At 122 feet from the portal a fault with 2 1/2 feet of gouge strikes east-west and dips 80 degrees to the north. No important mineralization was seen in the bedrock portion of the adit, which was mainly crumpled schists. In the talus, both in the adit and on the surface, blocks of quartz-carbonate rock contained nickel-bearing serpentine, disseminated galena, and a few specks of tetrahedrite.

WHITEHORSE MINING DISTRICT

CARMACKS AREA

Freegold Mountain

Ormsby Mines Limited (Laforma Property, 62°16'N, 137°06'W)

References: Bostock (1936a, pp. 52-56; 1941, pp. 22-26);  
Johnston (1937); Skinner (1961, pp. 33-35; 1962, p. 34).

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\* Reprinted in Geological Survey of Canada, Memoir 284 (Bostock, 1957, pp. 576-578).

Ormsby Mines Limited, controlled by Consolidated Discovery Yellowknife Mines Limited, holds 32 claims that include the original Laforma Group covering gold showings in the Freegold Mountain area. The property is reached by a 40-mile truck road from Carmacks, Yukon.

During 1962, the company built a camp at an elevation of 3,350 feet and drove the No. 4 level at the same elevation to test the mineralized structure at depth. The level was collared on August 5 and underground work discontinued on November 19, as the camp was not equipped for winter operation. A total of 1,364 feet of development work was completed. Up to 17 men were employed.

The original showing on the Laforma Group was staked by W. J. Langham in 1931 and development work has been done intermittently since. A number of showings are known, but most of the underground work has been done on a single zone, referred to as the G-3. Prior to 1962, underground work on this showing was done from adits at three levels: No. 1 at an elevation of about 3,900 feet, No. 2 at about 3,625 feet, and No. 3 at about 3,545 feet. The original owners put in the No. 1 level and commenced the No. 2. Both the N.A. Timmins Corporation, who optioned the property from August 1934 to June 1935, and the Yukon Consolidated Gold Corporation, who optioned the property from June 1935 to May 1936, did considerable work on the No. 2 level. T. C. Richards of Whitehorse, Yukon, optioned the property late in 1938, drove the 3rd level, and built a small mill at the portal of the No. 2 level. Mining commenced in January 1939 and continued until June 1940 when the option was dropped. Total production during this period was about 1,437\* ounces of gold (Bostock, 1941). Garskie Gold Mines Limited held an option on the Laforma property from 1951 to 1955. Some of the following information, particularly on the 2nd level, which is now inaccessible, is taken from a report prepared for the Company by consulting geologist, A. P. Beavan. Ormsby Mines Limited optioned the claims in 1957 and has subsequently purchased them.

The property lies west of the limit of the last glaciation, bedrock is deeply weathered, and exposures are poor. Most of the area near the workings is underlain by granitic rocks (Johnston, 1937). On both surface and underground, all gradations occur between fresh granitic rocks and highly altered ones in which only the quartz remains, both the feldspar and the mafic minerals having been replaced by fine-grained secondary minerals. Drusy cavities lined with fine quartz crystals occur in some of the altered rocks. Most of the granitic rocks are believed to be either quartz monzonite or granodiorite. The granitic rocks have been intruded by both quartz-feldspar porphyry and andesite porphyry. The quartz-feldspar porphyry is white and contains phenocrysts of quartz and feldspar to several millimeters in a fine-grained

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\*Does not include return from 52 tons of concentrate shipped during 1940.

matrix. This rock has also undergone alteration and both the feldspar phenocrysts and the groundmass are commonly replaced by minor calcite and fine unidentified material, probably mainly sericite. The andesite porphyry is grey-green and contains phenocrysts of feldspar. It has undergone a similar alteration.

The gold in the G-3 zone occurs in lenses of quartz and pyrite developed in a zone of shearing in the granitic rocks. None of the quartz veins below the No. 1 level exceeds 2 feet in thickness. The zone is adjacent to a contact between granitic rocks and quartz-feldspar porphyry for much of its length.

Most development work has been done on the 2nd level, now inaccessible, where the G-3 zone has been traced 800 feet trending 025 degrees azimuth and dipping steeply northwest. There, three gold-bearing veins occur within the zone, but insufficient development work has been done to recognize these three veins on the other levels (if they are present). Near the main crosscut on the 2nd level, the zone appears to swing to a northwest trend; this part may be continuous with a northwest-trending surface showing referred to as the Pal vein. A similar swing also occurs on the 3rd level and possibly on the 4th, although insufficient development work has been done to be certain of the latter.

The 4th level was driven at a bearing of 26 degrees azimuth for 1,062 feet, after which it was diverted slightly to the east, intersecting the projection of the G-3 zone 1,206 feet from the portal. The zone was then followed for 158 feet. Where intersected the zone trended east, but after a short distance it swung to a trend of 25 degrees azimuth, parallel to that on the 2nd and 3rd levels. The company reports (personal communication) that the average of face sample assays indicates two sections of low grade: 0.27 ounce of gold per ton over a width of 4.3 feet for a length of 52 feet, and 0.38 ounce of gold per ton over a width of 4.3 feet for a length of 17 feet.

When L. Green visited the property early in November, the above workings had just entered the G-3 zone, at which point the structure trended east and dipped vertically. Massive-appearing quartz-feldspar porphyry was exposed on the north wall and appeared to have an intrusive contact with altered granitic rocks. Within the zone, two irregular faults, which appeared to join at the point where they entered the workings, could be traced about 40 feet in the back to the face where they were about 5 feet apart. The space between them was filled with what appeared to be sheared and altered quartz-feldspar porphyry. Both breaks were irregular zones to a few inches in width and contained pods of both grey, greasy-appearing quartz, and fine pyrite. All rocks exposed within the G-3 zone are soft and appear to have been altered to sericite, carbonate, and possibly clay minerals. Those rocks away from the faults retain much of their original texture, but those close to them have been altered to a clay-like gouge in which little of the original texture remains. The intense alteration of the rock to clay-like material was observed only in the mineralized zone, but

less intense alteration of the feldspars to fine-grained secondary minerals was observed both on surface and underground.

The results of the 1962 operation indicate that the G-3 zone can be traced for a vertical distance of about 600 feet and that it is accompanied by intense shearing and the presence of a clay-like alteration throughout this distance. Gold within the zone is believed to occur in both irregular quartz veins or lenses and in irregular streaks and pods of fine-grained pyrite. Quartz-feldspar porphyry contacts appear to parallel the zone for over half the developed length.

### Nansen Creek

Mount Nansen Exploration Syndicate (62°04'N, 137°11'W)

References: Bostock (1936a); Northern Miner (Oct. 11, 1962); Canadian Mining and Metallurgical Bulletin (Nov. 1962, p. 830); Western Miner and Oil Review (Nov. 1962, p. 36).

Whitehorse prospector G. Dickson formed the Mount Nansen Exploration Syndicate in April 1962 to explore a gold-silver prospect about 14 miles south of the Laforma property and about 40 miles west of Carmacks. Backers of the Syndicate are Newmont Mining Corporation of Canada Limited, Noranda Mines Limited, Kerr-Addison Gold Mines Limited, Conwest Exploration Company Limited, Faraday Uranium Mines Limited, Rio Tinto Canadian Exploration Limited, Joseph J. Rankin, Canadian Exploration Limited, and Central Patricia Gold Mines Limited. About 269 claims blanket the area. The main or Webber showing is on what was known as the Carlson group of 1944-48. It is near the head of Webber Creek (a right limit tributary of Nansen Creek) at an altitude of about 4,500 feet and is about 5 miles south-southwest of Victoria Mountain. The property may be reached by a 17-mile tractor road, which crosses over Victoria Mountain and starts at the Carmacks-Laforma road about 33 miles from Carmacks. Access to the property is also provided by a 7-mile tractor road from Victoria Lake, which is suitable for float-equipped aircraft. During 1962, the airstrip near Victoria Lake was unusable.

Topography in the area is well rounded and unglaciated. By early September 1962, 20 large open-cuts on the Webber showing had been excavated to a depth of about 6 feet in the permanently frozen residual overburden. During the season, one diamond-drill hole using BX type core was completed, with a total length of 362 feet and a core recovery of 96 per cent. In addition to this, trenches on the old Heustis showing, some three-quarters of a mile to the southeast, were deepened and extended. Base camp was at the Brown McDade mine, about 9,000 feet east-southeast of the Webber showing. Up to 12 men were working on the property.

The Webber and Heustis showings are underlain by Yukon Group gneiss and schist (unit 1 - Bostock, 1936a). Tertiary(?) quartz porphyry dykes(?) cut the above unit. Immediately east of the Webber showing and north of the Heustis showing is a prominent, well-rounded hill called the Dome, which is composed mainly of quartz porphyry (unit 13 - Bostock, 1936a). On the Brown McDade property are extensive exposures of granitic rocks (unit 10 - Bostock, 1936a), and Mount Nansen Group volcanic rocks (unit 7 - Bostock, 1936a) are common in the area surrounding the showings.

Mineralization on the Webber showing appears to occur along a fairly continuous fault, and in discontinuous subparallel side fractures both of which trend about 155 degrees azimuth; some mineralized fractures crossing the above are present. The vein material is generally green scorodite-stained clay-like gouge or scorodite-stained quartz with finely disseminated sulphides. Galena occurs as minor pods, and is strongly replaced along the cleavage with a soft metallic black mineral. A white clay alteration in the wall-rock and vein is common. The Western Miner and Oil Review (November, 1962, p. 36) reported that the vein has "an average grade of 0.98 oz. gold and 20.06 oz. silver per ton over a three-foot width for a length of 700 feet ...". The character of the Heustis mineralization is similar.

## DEZADEASH AREA

### Sockeye Lake

Johobo Mines Limited Copper Property (Dominion Explorers Limited)  
(60°29'N, 137°34'W)

References: Kindle (1953, pp. 57-58); Skinner (1961, pp. 28-30; 1962, pp. 27-29).

Johobo Mines Limited, owned by H. Johannes, and H. E. Boyd of Whitehorse, and H. Honing of Leofnard, Sask., has a 58-claim copper property 2 miles southeast of Sockeye Lake and 18 miles south of Haines Junction. The property was optioned by Dominion Explorers Limited in September, 1961, and held by them until early 1963, when the property was returned to Johobo Mines Limited. The property is reached by a development road about 18 miles long, which leaves the Haines Road about Mile 143 and follows the south shore of Kathleen Lakes.

Dominion Explorers Limited commenced work on the property in October 1961 and were active until September 1962, when the camp was closed and the equipment and a number of the buildings moved from the property. A crew of up to 8 men was employed. During this period the company mined and shipped 1,062 tons of hand-sorted ore grading 20.17 per cent copper and 1 ounce of silver per ton. The ore was trucked to Haines, Alaska, from whence it went by barge

to the smelter at Tacoma, Washington. Previous shipments to Japan, made between 1959 and 1961, totalled 2,585 tons averaging about 23 per cent copper and 2 ounces of silver per ton.

The deposit was visited briefly in September, 1962, and the following description is based on observations made at this time, published information, and conversations with G. Warnock, Resident Manager of Dominion Explorers Limited.

The deposits consist of massive lenses composed essentially of bornite and chalcopyrite occurring in andesite of the Mush Lake Group, which Kindle (1953, pp. 31-35) described as a thick assemblage of volcanic and sedimentary rocks of possible Triassic or Jurassic age. Sulphide lenses were first discovered in the valley of Bornite Creek (Kindle, 1953, pp. 57-58), at an altitude of about 3,500 feet, but later similar lenses were found on the hillside 2,300 feet to the northwest at an altitude of about 3,340 feet. In previous years, open-cut mining was carried out in both areas, but the underground work and mining performed by Dominion Explorers Limited was confined to the hillside showings. The company also did a considerable amount of surface stripping elsewhere on the property.

Two adits were driven on the hillside. An upper level, at an altitude of about 3,435 feet, was collared in the north wall of an earlier open-cut and driven on a bearing of about 095 degrees azimuth for 100 feet. About 500 feet of additional exploratory drifting was done on this level. A lower level, at an altitude of about 3,340 feet, was collared 260 feet southwest of the upper portal and driven about 415 feet passing beneath the upper level 50 feet from the portal of the latter. The two levels are connected by a knuckle-back raise and an ore-pass.

The massive part of the lens cut on the upper level consisted of about 60 per cent chalcopyrite and 40 per cent bornite. It trended about east, dipped almost vertically, was under 50 feet in length, and did not extend to the lower level. G. Warnock reported that in transverse (N-S) section the lens thinned, widened abruptly, and then thinned to a point at depth, and that in longitudinal (E-W) section it thinned uniformly to a point at depth. He attributes the pinching and swelling of the lens to the damming effect of gouge in low-angle faults intersecting the steeply dipping main fault.

#### WHITEHORSE AREA

##### Whitehorse Copper Belt (60°37'N, 134°57'W)

References: Geological Survey of Canada (1962, a, b, c); Kindle (1963).

The release, early in January 1963, of Geological Survey of Canada (1962, a, b, c) aeromagnetic maps covering the Whitehorse

Copper Belt and a possible extension into the drift-covered area to the southeast, resulted in considerable staking activity. A total of 170 claims were recorded, reportedly for an undisclosed syndicate. New Imperial Mines Limited, which holds much of the ground within the Copper Belt, did only representation work during 1962.

## CARCROSS AREA

### Montana Mountain

Jean Group (New Imperial Mines Limited) (60°04'N, 134°42'W)

Reference: Skinner (1962, pp. 35-36).

The Jean Group of 23 mineral claims, of which 3 are owned by Mathew Watson of Carcross, is situated about 7 miles south of Carcross on Montana Mountain, about a mile northwest of the peak. Access is by a 10-mile truck road. New Imperial Mines Limited optioned the property in 1960 and in 1961 commenced, on the Jean claim, an adit intended to cut the gold-bearing quartz vein of the main showing at depth. In 1962, the adit was extended to a total length of 226 feet but did not intersect the vein. The company plans to continue work on the adit in 1963.

## WATSON LAKE MINING DISTRICT

### PELLY MOUNTAINS AREA

#### St. Cyr Range

Tintina Silver Mines Limited (61°09'N, 131°09'W)

References: Wheeler, Green, and Roddick (1960); Northern Miner (Nov. 2, 1961); Skinner (1962, pp. 37-39).

Tintina Silver Mines Limited was formed to explore a number of silver-lead-zinc showings located approximately 105 miles northwest of Watson Lake and 7 miles northwest of the confluence of the Ings and Upper Liard Rivers. The company, in which Conwest Exploration Company Limited has an 80 per cent interest and Central Patricia Gold Mines Limited, 20 per cent, holds 302 claims in the area comprised of the Eagle group of 130 claims, the Ram group of 104 claims, the It group of 36 claims, and the El group of 32 claims.

Early in 1962, a 110-mile winter road was built from the Alaska Highway, near Teslin, Yukon, and the mining equipment and camp buildings moved in over it. An airstrip was also built in the wide valley bottom approximately 6 miles southwest of the showing. Access to the property during the summer of 1962 was by fixed-wing aircraft

and helicopter. Fixed-wing aircraft used either the airstrip or a small lake approximately 4 1/2 miles west of the showing.

The deposits were discovered in July 1961, and work done during the remainder of the field season included sampling, Packsack diamond-drilling, and preliminary geological mapping. Work done during 1962 consisted of approximately 1,830 feet of underground development, 22 underground diamond-drill holes with a total length of 3,201 feet, 6 surface diamond-drill holes with a total length of 625 feet, an electromagnetic survey, and surface geological mapping. Up to 35 men were employed during 1962. The results of this work were considered disappointing and late in the year arrangements were made to remove the camp buildings and mining equipment from the property.

The more important showings occur at an elevation of over 5,000 feet in a small north-trending cirque-valley nestled on the side of and parallel to a spur extending from a high area of granitic rocks some 4 miles to the north-northwest. At the northern end of the valley the small creek draining it drops precipitously to the east into a tributary of the Ings River. The main camp is on a bench on the west side of the main ridge at an elevation of about 4,500 feet, well above a creek draining into the Liard River.

The sedimentary rocks near the showings can be divided into two units: a lower, of limestone and argillite, and an upper, of slaty limestone. The lower unit contains one band and possibly two bands of chiefly massive, reddish-buff weathering, dark grey limestone cut by numerous veinlets of secondary white calcite; purplish-brown argillite, probably composed of secondary minerals; and dark grey to black graphitic argillite. A thick limestone at the base of the exposed section contained Archaeocyathids of Early Cambrian age. The upper unit is much more uniform and consists of a considerable thickness of brown-weathering, dark grey, silty limestone, with well-developed slaty cleavage. The sedimentary rocks are cut by both granitic rocks, which occur less than a mile to the north of the showings, and lamprophyre dykes, near the showings.

The lower unit is believed to correspond to parts of unit 1 of Early Cambrian age, and the upper unit to unit 2 of Middle and Late Cambrian(?) age, as mapped by Wheeler, Green, and Roddick (1960).

The simplest structural interpretation of the area around the showings is a series of open, northwest-trending folds in the lower unit. This unit is truncated to the west by a north-trending fault, which brings the limy slates of the upper unit in contact with it. Several features suggest the structure may be much more complex. The various rock types within the lower unit do not have consistent thicknesses and places were observed in which some of them, particularly limestone, appeared to thin out and disappear. Bedding is not visible in most of the area, but where observed it often dipped too steeply to be in accord with the apparent open folding. Another possible inconsistency is the highly-developed foliation that strikes



northwest and dips steeply southwest. More complex structure occurs 2 miles to the northwest where the incompetent phyllites near the contact with granitic rocks are thrown into attenuated isoclinal folds with axial planes that dip very gently away from the contact.

The more important showings within the cirque-valley have been described as Nos. 1 to 9. Showings No. 1, 2, 3, and 4 occur near the north end of the valley just west of the creek draining it. All appear to consist of irregular pods of sulphides developed in the limestone of the lower unit near the contact with an overlying black argillite of the same unit. Dips in this area appear to be gentle and it is possible that all four showings occur in the same stratigraphic position. The sulphides are mainly galena and brown sphalerite. Other minerals include vein quartz and a pale green silicate (probably tremolite-actinolite) that is commonly associated with the sphalerite-rich parts of the mineralized zone. In the western part of No. 1 showing, the limestone is much thinner and the sulphides occur in a thin band of skarn material between black argillite and underlying brown argillite. No. 3, the most impressive showing of the group, can be traced for over 100 feet around the nose of a small open syncline. It consists of scattered pods of sulphides, mostly high in sphalerite content, which at one point are spread through a thickness of almost 10 feet beneath the black argillite contact. The original sampling on this showing (Northern Miner, Nov. 2, 1961) returned 36.8 ounces of silver per ton, 13.4 per cent lead, and 9.2 per cent zinc over a length of 95 feet and across 6.6 feet. Showing No. 5, approximately 1,100 feet south of showings No. 1 to 4, consists of scattered sulphide minerals in a lens-like body with a maximum thickness of 4 feet. It occurs in brown weathering, dark grey limestone, and is possibly 50 feet beneath the contact of the limestone with the overlying black argillite. One lens, 2 feet thick, composed essentially of massive galena, was exposed for a distance of 3 feet. The original sampling on this showing (Northern Miner, Nov. 2, 1961) returned 36.9 ounces of silver per ton, 15.1 per cent lead, and 16.0 per cent zinc over a length of 75 feet and across 4.8 feet. Showing No. 6, approximately 250 feet south of No. 5, occurs in the limestone at the contact with overlying brown weathering, purplish brown argillite, and can be traced for approximately 70 feet. The showing consists of some massive sulphides and a considerable amount of quartz with minor sulphides. The original sampling on this showing (Northern Miner, Nov. 2, 1961) returned 88.8 ounces of silver per ton, 24.8 per cent lead, and 4.5 per cent zinc over a length of 70 feet and across 4.3 feet. Showing No. 7, 350 feet southeast of No. 6, occurs along a fault trending 070 degrees azimuth, which can be traced for 110 feet. Throughout much of its length, the fault consists of a rusty gouge zone about 1/2 inch wide, but in places it contains galena up to 6 inches wide. In addition, galena locally fills small off-shoots, which may extend as much as 6 inches from the fault. A parallel fault, up to 6 inches wide and mineralized mainly with sphalerite, occurs 15 feet away and can be traced for a short distance. Showing No. 8 occurs in the slaty limestone of the upper unit approximately 400 feet southwest of No. 6. It occurs along a fault and can be traced on the steep hillside for about 400 feet. The fault trends about

N50°W and dips about 40°SW. The vein ranges in thickness from less than a foot to more than 6 feet and contains mainly gossan and secondary calcite plus some sulphides. Galena occurs in thin veinlets and pods up to 1 foot thick within the fault and in parallel faults that occur as much as 15 feet away. Sphalerite is commonly more disseminated and occurs both within the fault and the adjacent wall-rocks. The original sampling of two parts of this showing (Northern Miner, Nov. 2, 1961) returned: ("8A") 35.1 ounces of silver per ton, 19.9 per cent lead, and 4.9 per cent zinc over a length of 52 feet and across 6.4 feet; and ("8B") 33.0 ounces of silver per ton, 15.7 per cent lead, and 10.6 per cent zinc over a length of 112 feet and across 3.7 feet. Showing No. 9 occurs in the slaty limestone of the upper unit about 300 feet southwest of showings Nos. 1 to 4. It can be traced for a short distance and consists of a foot or so of sulphides with associated vein quartz and calcite. It appears to have developed along a thin band of argillite within the slaty limestone. In addition to the showings referred to, a number of other widely scattered silver-lead-zinc showings have been discovered on the property.

The underground workings were planned to test No. 5, 6, and 8 showings at depth. The 101 crosscut, to test the No. 8 showing was driven 1,088.5 feet on a bearing of 200 degrees azimuth. It passed through limestone, argillite, and graphitic argillite of the lower unit and ended in slaty limestone of the upper unit. The drive, which was almost 300 feet below the No. 8 showing, did not pick up the lower extensions of the latter. Underground drilling suggested that the mineralized zone could be traced for 100 feet beneath the surface. The 102 crosscut, to test the 5 and 6 showings, turned off the 101 crosscut at a point 185 feet from the portal and was driven 571 feet on a bearing of about 150 degrees azimuth. The crosscut was mainly in limestone. Sulphides were lacking beneath both showings, although some were cut in both the 101 and 102 crosscuts and traced by drilling between them.

Although the silver values obtained on the property are encouraging, exploration to date has been unsuccessful in blocking out sufficient tonnages. Two types of mineralization occur, irregular pods parallel to the bedding, often beneath an argillite contact, and vein deposits. Showings 1, 2, 3, 4, 5, 6, and possibly 9 belong to the former type, and showings 7 and 8 to the latter. The best hope for further exploration would appear to lie in careful examination of limestone-argillite contacts. The deposits show many similarities to those occurring elsewhere in the Lower Cambrian carbonates, namely the Ketzia district, about 75 miles to the northwest, and near Mile 701 on the Alaska Highway, about 70 miles to the south.

Quiet Lake

Conwest Exploration Company Limited Molybdenite Showing (61°10'N,  
132°26'W)

References: Conwest Exploration Co. Ltd. (1963); Northern  
Miner (Oct. 11, 1962).

Late in the prospecting season the company announced the discovery of a molybdenite showing about 20 miles east of Quiet Lake. The company holds 72 claims in the area. It is reported that mineralization is exposed at intervals over a distance of 1,500 feet and that samples taken from several locations are of ore grade. Investigation of the showings is planned for the 1963 field season.

PELLY PLATEAU AREA

Traffic Mountain

Canadian Yukon Mining Company Limited (Norken, Fool, Peak, and  
Rain Groups) (62°15'N, 130°42'W)

References: Green and Roddick (1961); Skinner (1962, p. 41).

The company holds 40 claims located about 12 miles northwest of Traffic Mountain and about 60 miles east-northeast of Ross River. A small lake just north of the property is suitable for fixed-wing aircraft.

Work has been carried out by the present company since 1959 and has consisted of geological mapping, trenching, electromagnetic and magnetometer surveys, and diamond-drilling. In 1961, 5 holes with a total length of 1,800 feet were drilled and, in 1962, 8 holes with a total length of 2,800 feet were drilled.

Aside from scattered showings there is little outcrop on the claim group. Two of the more important showings, the Nipple, at an approximate elevation of 4,200 feet, and the Copter, at an approximate elevation of 4,900 feet and situated 4,200 feet east of the former, carry disseminated pyrrhotite, pyrite, and chalcopyrite. Elsewhere, float carrying encouraging values in copper, silver, lead, and zinc was discovered.

The electromagnetic survey indicated two parallel anomalies trending approximately 120 degrees azimuth. One of these passed near the Nipple showing and was traced for about 8,500 feet and the other near the Copter, for 800 feet. Drilling revealed that the anomalies were caused mainly by disseminated pyrrhotite rather than the type of mineralization exposed in the showings or found as float.

A number of the drill cores were examined during a brief visit to the property. The most common rock types are a purplish-brown and green finely banded hornfels and a dark grey to black argillite. The hornfels appears to be composed of very fine grained silicates. Frequently, it has been altered to very fine grained white material (chiefly quartz?) and in some places this alteration was observed to end abruptly at a hairline fracture. The banding of both the hornfels and the argillite showed numerous minor faults and folds, including some very attenuated isoclinal folds. Small amounts of sulphides, chiefly pyrrhotite, are widespread. The sulphides occur both as concentrations along the fine banding of the rock and in tiny crosscutting veinlets filled with quartz, calcite, and sulphide.

Green and Roddick (1961) have shown the claim group as underlain by Ordovician and Silurian chert and shale (their map-unit 3). However, the lithology of the drill core corresponds very closely to their unit 1a as mapped on Traffic Mountain, 12 miles to the southeast, where it is described as "light grey and whitish quartzite, banded hornfels and granulite, grey quartzite, skarn; minor chert and crystalline limestone" and is considered to be of Proterozoic age. Unit 1a has not been accurately dated in the general area and the close association of this unit with the Ordovician and Silurian chert and shale (unit 3) on both the claim group and Traffic Mountain suggests that the two (1a and 3) may be of the same age.

## CASSIAR MOUNTAINS AREA

### Rancheria River

Luck Group (60°06 1/2'N, 130°25'W)

During the 1962 field season, Scurry-Rainbow Oil Company Limited, of Calgary, Alberta, optioned and explored a silver-lead showing on the Luck Group. The showing is in the valley of Boulder Creek, a tributary of Rancheria River, and is reached by a 3-mile access road, which leaves the Alaska Highway near Mile Post 701. The group consists of 15 claims and is owned by E. Krysko and J. Poykans both of Edmonton, Alberta.

When the writers visited the prospect in mid-July, 9 large open-cuts had been excavated and a diamond-drilling program commenced. Previous to this, self-potential and EM geophysical surveys and a geochemical survey were made of the group. During the season, a diamond-drill program of 13 holes with a total length of 2,591 feet was completed. Up to 13 men were employed.

Poole, Roddick, and Green (1960) have mapped the country rock as unfossiliferous grey limestone, with minor dolomite, slate, and phyllite. They consider the unit to be of probable Cambrian age. Granitic rocks of the Cassiar batholith occur 1 1/2 miles southwest

of the showing. Much of the group is covered by overburden, but sulphides are exposed in the discovery pit and in a nearby open-cut. Rock types in this open-cut consist of brown weathering, massive, sugary-textured, grey limestone, brown weathering, platy, grey phyllitic limestone, and phyllite. Small calcite-filled fractures are common in both the massive and the phyllitic limestone. The massive limestone occurs in the upper part of the cut and is separated from the phyllitic limestone in the lower part by a calcite-filled fault, which trends east and dips steeply south. A subparallel fault cuts the phyllitic limestone less than 30 feet to the south. The sulphides occur in the phyllitic limestone between the two faults and consist of a zone 4 to 5 feet thick mineralized mainly with disseminated cinnamon-brown sphalerite and pyrite. Both sulphide minerals are fine grained. This mineral zone is overlain by a rusty weathering iron- and manganese-stained zone up to 6 feet thick, which contains minor fine sphalerite and pyrite. Massive galena frequently occurs in small lenses to 6 inches long and a few inches thick. These lenses are most common at the contact of the lower mineralized zone with the rusty-weathering capping. Within the mineralized part, much of the carbonate is believed to be dolomite. The mineralized zone appears to dip gently to the south parallel to the foliation of the enclosing phyllitic limestone. Assays were made of selected samples to determine the silver-lead ratio.

	Gold oz. ton	Silver oz. ton	Lead %	Zinc %	Copper %	Antimony %
Grab sample of relatively massive galena from a small lens	0.005	37.01	43.60	4.54	0.046	0.11
Grab sample, heavily mineralized with galena and sphalerite	0.005	27.31	36.60	14.48	0.043	0.05
Grab sample, mineralized with galena and sphalerite	0.005	4.39	11.99	16.12	0.02	0.05
Chip sample across 4 1/2 feet of the iron-stained cap	0.0025	0.58	0.45	4.28	0.023	0.05

(by Mineral Sciences Division, Mines Branch, Department of Mines and Technical Surveys)

The mineralization at this deposit appears to be similar to part of that at the Tintina Silver Mines Limited Property.

LIARD PLAIN AREA

Tom Lake

Frances River Syndicate Property (60°32'N, 128°52'W)

References: Northern Miner (Nov. 1, 1962); Western Miner and Oil Review (Nov. 1962, p. 32).

During the 1962 field season, J. Hundere and P. Ritco, prospectors employed by Frances River Syndicate, discovered promising lead-zinc showings about 8 miles northwest of Tom Lake in an area that was not previously known to contain mineralization. The Syndicate, which now holds 320 claims in the area, was organized by consulting geologist A. E. Aho, of Vancouver, and backed by Canex Aerial Exploration Limited, Newconex Canadian Exploration Limited, Kerr-Addison Gold Mines Limited, and Anglo-Huronian Limited. The property is about 35 miles north of Watson Lake, Yukon, and is reached by a 12-mile access road from the Watson Lake - Ross River development road. The authors did not visit the property and the following description is drawn from published information.

The two main showings were found as zones of float and frost heave 2 miles apart, each at an elevation of about 4,700 feet. They are reported to occur as replacements in a zone of limestone bands near the east margin of an intensely deformed north- to north-northwest-striking belt of phyllite and limestone 4 miles wide and about 6 miles long.

The south showing consists of a zone of galena and sphalerite with some quartz, fluorite, and skarn gangue apparently replacing gently southwest-dipping limestone. In late September, 1962, limited bulldozer stripping to permafrost exposed massive primary sulphides averaging 5.25 ounces of silver per ton and 34.4 per cent lead and 18.3 per cent zinc over a length of 170 feet and an average apparent width of 34 feet. Three trenches, about 50 feet apart and 200 feet from the first mineralized zone, revealed a residual goethite averaging 3.5 ounces of silver per ton, 11.6 per cent lead, and 5.0 per cent zinc over a length of 160 feet and apparent widths up to 50 feet.

The north showing consists of lenses of galena and sphalerite with skarn minerals replacing north-striking, steeply dipping lenses of limestone enclosed in phyllite. Nine bulldozer trenches about 50 feet apart across the zone of two or three separate lenses have indicated a length of 420 feet with an average grade of 1.2 ounces of silver per ton, 11.3 per cent lead, and 7.2 per cent zinc across an aggregate average width of 25 feet. The main sulphide lens is about 250 feet long assaying 1.3 ounces of silver per ton, 14.3 per cent lead, and 10.0 per cent zinc across a width of 42 feet. Much of the trenching is reported to be in an oxidized mineral zone, probably in the form of carbonates.

The property is in an area with relatively poor outcrop and the limits of both showings have not been fully determined. In addition, a number of other minor showings, float indications, and geochemical anomalies remain to be investigated. Plans for the 1963 field season are reported to include geochemical and geophysical surveys, bulldozer trenching, and diamond-drilling.

NAHANNI MINING DISTRICT (DISTRICT OF MACKENZIE)

SELWYN MOUNTAINS AREA

Upper Flat River

Canada Tungsten Mining Corporation Limited (61°57 1/2'N, 128°15'W)

References: Green and Roddick (1961); Brown (1961); Skinner (1961, pp. 43-46; 1962, pp. 41-43).

Canada Tungsten Mining Corporation Limited was formed in 1959 to develop a tungsten deposit near the headwaters of the Flat River, 130 miles north of Watson Lake, Y.T. The company holds 125 claims and in 1962 held three Northwest Territories prospecting permits (95 E/13, 95 E/12 and 105 H/16) in the vicinity of the mine.

Published ore reserves for the main orebody, prior to mining were 1,176,400 tons containing 2.47 per cent tungsten trioxide and about 0.5 per cent copper. This orebody, at an elevation of about 4,800 feet, is exposed on the floor of a small cirque on the west side of the valley of the Flat River. The mill and townsite, at an elevation of about 3,500 feet, have been built on a bench in the main valley near the small creek draining the cirque. The two are connected by 3 miles of switchback road.

Early in 1962, a winter road, approximately 200 miles long, was completed between the property and Watson Lake. Mill and camp equipment were freighted to the property at this time. During the summer months, the camp was supplied by a DC-3 and an Anson aircraft operating between Watson Lake airport and the airstrip at the property. Late in 1962, an all-weather road to the property was completed.

During 1962, approximately 85,000 tons of ore were mined from an open-cut on the main orebody by Isbell Construction of Canada Limited. Other contractors completed houses and mine buildings and installed a 300-ton-per-day mill. Up to 250 men were employed during the peak of the construction. The mill was put into operation late in 1962 and the first sample shipments of tungsten concentrates were made early in 1963. Copper concentrates are currently being stockpiled pending completion of shipping arrangements.

Exploration was carried out during the field season by three two-man prospecting parties working within the permit areas. A limited amount of diamond-drilling was done on one showing (6 holes totalling 774 feet) and near the main orebody (3 holes totalling 860 feet). No important discoveries were made. A Bell G-2 helicopter was used to support the prospecting parties and transport the drilling equipment.

Mapping in the vicinity has shown a close relationship between the lithology of the sedimentary rocks and tungsten occurrence. A Table of Formations, as established by S. L. Blusson (personal communication, and in Jenness, 1963, p. 16) in the vicinity of the mine is as follows:



Era	Period or epoch	Unit and thickness (feet)	Lithology
Mesozoic	Cretaceous(?)	Intrusions	Quartz monzonite, granodiorite; minor granite
		Intrusive                      Contact	
Palaeozoic	Ordovician and Silurian	2000+	Black shale; slate; minor chert, siltstone, and dark limestone
	Unconformity		
	Middle and Late Cambrian	4000+	Intercalated platy impure limestone, siltstone and limestone
	Unconformity		
	Early and/or Middle Cambrian	1000±	Dolomite, silty and sandy dolomite; minor sandstone and shale
		150±	Bright yellow and orange-weathering silty and sandy dolomite
	Early Cambrian	2000±	Sandstone, sandy and silty dolomite, dolomite, argillite; minor quartzite and impure limestone
		'Ore-limestone' 200±	Blue-grey fine-grained limestone and coarse-grained marble
		'Swiss cheese limestone' 200±	Irregularly interbanded calcareous siltstone and impure limestone; pods and lenses of limestone
Proterozoic	Probably late Proterozoic	4000+	Phyllite, slate, siltstone, fine-grained quartzite

Tungsten deposits occur near intrusive rocks and have two principal modes of occurrence:

1. Scheelite replacement of a dark green pyroxene skarn developed within the "Ore limestone" member. Some quartz-scheelite veins are also present. The orebody under development and other principal prospects are of this type.
2. Scheelite disseminations in light coloured, calc-silicate hornfels at the contact of Middle and Upper Cambrian impure platy limestone and granitic intrusions. Deposits of this type are small, low grade, and unlikely to be of commercial value.

The "Ore limestone", with a few exceptions, is known to occur only on the southwest side of Flat River valley, generally within 5 miles of the mine. Elsewhere it is lacking as a result of rapid facies changes, or is cut out either by minor unconformities within the Lower Cambrian units or by the unconformity at the base of the Middle and Upper Cambrian platy impure limestone. The areas for further exploration of this unit are, therefore, limited.

Flat River valley parallels the structural trend of the region and is eroded in a complex syncline formed of Cambrian to Ordovician strata, flanked to the northeast and southwest by strongly deformed Proterozoic sedimentary rocks. Large areas of the deformed strata have subsequently been intruded by crosscutting granitic stocks, which have in places deflected the northwest-trending structures and caused local doming.

Detailed mapping during the 1962 field season by S. L. Blusson and by company geologists showed that in the vicinity of the mine Lower Cambrian sedimentary rocks are exposed on both limbs of an overturned syncline with axial plane dipping moderately to the southwest. This fold is complicated by minor folds on the limbs and is sharply truncated by quartz monzonite stocks about 4,000 feet to the northwest and 3,000 feet to the southeast of the orebody. Differing degrees of metamorphism on the limbs of the syncline mask the repetition of the units and the fold was not recognized in earlier mapping in the area. The orebody occurs on the lower, flat-lying limb of this fold and this structure would appear worthy of further exploration, particularly to the northwest.

## MACKENZIE MOUNTAINS AREA

### Dal Lake

Redstone Mines Limited (63°08'N, 126°30'W)

References: Northern Miner (Aug. 30 and Nov. 15, 1962);  
Baragar and Hornbrook (1963).

Redstone Mines Limited, incorporated in December, 1961, acquired the interests of the Nahanni Sixty Syndicate, which carried out exploration in this region in 1960 and 1961. As of June 18, 1962, Redstone Mines Limited held three prospecting permits (covering the area from 62°30' to 63°15'N lat. and 126°30' to 127°00'W long.) and 173 mineral claims, 150 of which lie within permit areas.

A helicopter-supported party, of up to 25 men based at Dal Lake (63°08'N, 126°30'W), carried out prospecting and exploration during the 1962 field season. The company and its predecessor have worked on a number of showings including the Munro, the McBean, the Mac, the Hidden Valley, and the Johnson, which are described elsewhere (Northern Miner, Aug. 30 and Nov. 15, 1962; Baragar and Hornbrook, 1963). Only three of these showings, the Munro, the Colwell, and the Johnson were visited during a brief stay with the party in late August, 1962.

Most of the three permit areas appear to be underlain by Lower Palaeozoic and older rocks. Company geologists have been able to trace a large number of mappable units within the permit area. The following generalized stratigraphic section, based principally on reconnaissance flying by the senior author to the west and northwest of the permit area, is suggested:

Lower Middle Devonian

Massive, grey weathering limestone.

Unconformity

Ordovician to Silurian

Grey weathering carbonate, chiefly dolomite.

Unconformity

Lower to Middle Cambrian(?)

Purple, with some green weathering conglomerate mudstone, and minor conglomerate with thin iron-formation near the base and local basal conglomerate.

Unconformity

Precambrian(?)

Orange, buff, grey, and minor pink weathering carbonate and quartzite (silty dolomite prominent near the top, quartzite towards the base). Grey and buff weathering carbonate (not examined).  
Brown weathering shale or phyllite (not examined).

Folds are open in most of the permit area, but locally, complex areas marked by overthrusts and vertical to overturned beds occur. Most of the fold axes and thrust faults trend north parallel to the regional trend.

Munro Showing (62°41'N, 126°38'W)

The original showing outcrops on the east side of the ridge east of Little Dal Lake (referred to as Plateau Lake in company reports). Copper minerals, which have been traced over 19,000 feet, are confined to three persistent beds of green weathering carbonate-rich rock near the apparent top of a section about 1,000 feet thick composed of brilliant purple weathering mudstone and siltstone. The unit strikes north and dips steeply west. It appears to be underlain by grey weathering carbonate, similar to that of Ordovician to Silurian age, and overlain by approximately 750 feet of platy, grey to brown weathering carbonate, chiefly limestone, which in turn is overlain, apparently conformably, by the purple weathering conglomeratic mudstone and iron-formation of probable Early to Middle Cambrian age. However, it is probable that the structure in this area is complicated by thrust faults or isoclinal folds and the apparent section may not be valid.

A section measured through the mineralized beds on the ridge east of Little Dal Lake is as follows:

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Top

Gradational contact with platy, buff weathering, dark grey carbonate.

Upper Greenish Carbonate Bed (15 feet)

6 ft. Blue-green, fine-grained dolomitic siltstone, with some copper stain.

9 ft. Green siltstone, slightly dolomitic, with pronounced shaly parting.

Intermediate Purple Beds (40 feet)

40 ft. Thinly interbedded purple mudstone, with a few green bands, and buff, crossbedded, slightly limy, siltstone.

Middle Greenish Carbonate Bed (7 feet)

4 ft. Pale green siltstone, gradational from the overlying purple mudstone.

3 ft. Pale green dolomitic siltstone, with fine-grained secondary copper minerals grading into pale green and buff dolomitic shale towards the base.

Intermediate Purple Bed (42 feet)

42 ft. Purple mudstone with a few thin beds of crossbedded, pale buff weathering, dolomitic siltstone.

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Top

Lower Green Carbonate Bed (6 feet)

- 3 ft. Pale green sandy limestone with considerable copper staining.
- 2 ft. Pale greenish buff dolomitic siltstone with secondary copper minerals in fine veinlets and in small lenses parallel to the bedding.
- 1 ft. Pale buff siltstone.

Underlying Purple Beds

- 50+ ft. Purple mudstone with numerous bands of crossbedded, buff siltstone to 1/2 inch in thickness.

Base

Remainder of section not measured.

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The company has reported (Northern Miner, Nov. 15, 1962) that the best copper values are found in the lower green carbonate bed where preliminary samples averaged 2.30 per cent copper across 6.5 feet along a length of 9,100 feet at the north end, followed by less than 1 per cent copper along 3,500 feet and 3.74 per cent copper across 5.5 feet along 6,400 feet at the south end.

Johnson Vein (63°06'N, 126°51'W)

The vein is exposed in a pit on a small spur about 6,000 feet elevation, where it strikes about 105 degrees azimuth and dips vertically. In one direction it projects into the air and, in the other, mineralized float has been traced approximately 1,200 feet across a steep talus slope to the main ridge. The country rock is fractured, buff weathering, fine-grained, grey dolomite of probable Precambrian age.

In the pit, fairly massive sulphides occur over a width of about 18 inches and disseminated sulphides over 5 feet. A sample taken by the company in 1961 assayed about 13 per cent copper over 5 feet. A specimen of the more massive sulphide material taken by the senior author contained chalcopyrite, goethite, and secondary copper carbonates. A weakly mineralized specimen contained chalcopyrite, copper carbonates, strontianite, and quartz.

Colwell No. 1 Showing (63°09'N, 126°49'W)

The showing occurs at an elevation of about 4,000 feet on the west side of a steeply walled creek draining into Redstone River.

The country rock consists of grey, buff, and some pink weathering, silty dolomite of probable Precambrian age, which strikes about N25°E and dips 45°NW. Massive, pale pink quartzite underlies the dolomite in the creek bottom and is prominent on the opposite side of the creek. The dolomite is overlain unconformably by purple weathering conglomeratic mudstone, of possible Early to Middle Cambrian age; the mudstone caps the ridge between the tributary valley and the main valley of Redstone River.

The showing lies within a rusty weathering zone, which appears to extend 250 feet up the hillside and have a maximum width of 100 feet. Within this zone are numerous irregularly shaped pods and veinlets of coarsely crystalline, rusty weathering, ankeritic (?) dolomite, and blebs of a mineral of the tetrahedrite-tennantite group that is partly altered to secondary minerals. One patch of massive sulphide, approximately 2 feet by 1 foot, was observed but most are less than 6 inches in maximum dimension. At the time of the senior author's visit, a natural cave was being enlarged to obtain a flat face for systematic sampling. It is reported (Northern Miner, Aug. 30, 1962) that preliminary sampling over 3 feet returned 27 ounces of silver per ton and 17 per cent copper.

## PLACER MINING

### DAWSON MINING DISTRICT

#### KLONDIKE AREA

#### The Yukon Consolidated Gold Corporation Limited

References: Skinner (1961, pp. 6-9; 1962, pp. 5-8)

The Yukon Consolidated Gold Corporation Limited was formed in 1923 from 8 companies with interests in the Klondike area. The company operated five electrically driven dredges and two bulldozer-sluicing plants in the Klondike area in 1962. The company holds most of the placer ground in the district (802 claims and two hydraulic leases). This is on Hunker and Bonanza Creeks, southern tributaries of Klondike River, and on Dominion, Sulphur, and Quartz Creeks, northern tributaries of Indian River. A 100-mile network of roads connect all operations with Dawson and with the company's office, shops, gold room, etc., at Bear Creek, 8 miles east of Dawson. The company also operates a 15,000-hp. hydroelectric plant on Klondike River about 4 miles below the junction of the north and south forks of the river. This plant supplies power to the city of Dawson and drives the dredges and other mining equipment.

Available figures on operations of the company (from Financial Post Survey of Mines, 1963, p. 268) are as follows:

Year	Cubic Yards Treated	Value of Gold (and Silver) Recovered
1932-58	172,516,298	\$45,244,800
1959	5,914,587	1,804,449
1960	4,517,964	2,182,134
1961	4,041,022	1,925,552
Total	186,989,871	\$51,156,935

Most of the following information concerning the 1962 operations of the company was supplied by Mr. A.G. Barrett, manager, Dawson. The cooperation of the company is gratefully acknowledged.

### General

In 1962 the Yukon Consolidated Gold Corporation employed a maximum labour force of 311 men, mined a total of 4,682,953 cubic yards of gravel and produced gold and silver with a value of \$1,512,511. Proven gravel reserves written off during 1962 were 4,233,262 cubic yards and proven gravel reserves at the end of 1962 were 13,919,418 cubic yards valued at \$5,931,157 (42.5 cents per cubic yard).

### Mining Operations

#### Dominion Creek

Dredge No. 6 (7-cubic-foot buckets) is working down lower Dominion Creek about 1 mile south of Granville. In 1962 this dredge operated from May 1 until November 15, mined 1,061,917 cubic yards at a cost of 25.1 cents per cubic yard, and recovered 7,821 ounces of fine gold and 1,641 ounces of silver valued at \$282,726. Work started on the dredge and site on April 2 and finished on November 21. The thawing plant ahead of the dredge operated from June 2 to September 12 and thawed 1,176,918 cubic yards of gravel at a cost of 6.8 cents per cubic yard. Work on the plant and site started on April 13 and finished on September 30.

Dredge No. 10 (7-cubic-foot buckets) is working down middle Dominion Creek about 1/2 mile south of the mouth of Jensen Creek. In 1962 this dredge operated from May 2 to November 22, mined 1,128,656 cubic yards at a cost of 25.6 cents per cubic yard, and recovered 5,532 ounces of fine gold and 1,134 ounces of silver valued at \$196,257. Work started on the dredge and site on April 5 and finished on November 25. The thawing plant ahead of the dredge operated from May 24 to September 27 and thawed 1,489,430 cubic

yards of gravel at a cost of 4.9 cents per cubic yard. Work on the plant and site started on April 13 and finished on October 11.

#### Dominion Creek Benches

Bulldozer mining operation No. 15 is on the left limit bench of middle Dominion Creek about 2 1/2 miles above Jensen Creek. During 1962 the plant operated from July 22 to September 30, mined 120,282 cubic yards of gravel at a cost of 84.1 cents per cubic yard, and recovered 5,254 ounces of fine gold and 1,057 ounces of silver valued at \$185,196. Work started on the plant and site on April 29 and finished on October 10.

When visited in late September, a 5-man crew and 2 D-8 bulldozers were employed in the operation. Water is supplied to the dump box of the sluice under pressure. The sluice-box is set at a 16 to 17 per cent grade. The bench is about 7 feet above the present level of Dominion Creek and a section exposed at the edge of the cut consisted of 4 to 6 feet of gravel overlain by 10 to 15 feet of muck, the latter containing much silt. Bedrock composed of soft garnetiferous quartz-muscovite-chlorite-biotite schist is mined to a depth of 2 to 3 feet.

Bulldozer mining operation No. 16 is on the left limit bench of middle Dominion Creek about 1/2 mile above Jensen Creek. During 1962 the plant operated from June 3 to July 22, mined 85,285 cubic yards of gravel at a cost of 61.3 cents per cubic yard, and recovered 780 ounces of fine gold and 158 ounces of silver valued at \$27,631. Work started on the plant and site on April 14 and finished on October 22. The stripping plant operated from August 3 to October 7 and removed 352,095 cubic yards of overburden at a cost of 7.6 cents per cubic yard. Work started on the plant and site on May 1 and finished October 22.

Dredge operation No. 17, to be located on the left limit bench of middle Dominion Creek just under 2 miles above Jensen Creek, is to use Dredge No. 12 (2 1/2-cubic-foot buckets). This dredge is presently located on the left limit bench of Dominion Creek 1 mile below Jensen Creek and is to be moved to the bench for the 1963 operations. The thawing plant for No. 17 operated from May 23 to August 27 and thawed 401,342 cubic yards of gravel at a cost of 8.0 cents per cubic yard. Work on the plant and site started on April 13 and finished on September 27. The stripping plant for No. 17 operated from May 18 to October 3 and removed 561,678 cubic yards of overburden at a cost of 8.3 cents per cubic yard. Work started on the plant and site on April 13 and finished on October 25.

#### Sulphur Creek

Dredge No. 8 (7-cubic-foot buckets) is working down Sulphur Creek about 1 mile north of Granville. In 1962 this dredge



operated from May 2 until November 22, mined 1,010,242 cubic yards of gravel at a cost of 23.1 cents per cubic yard, and recovered 6,782 ounces of fine gold and 1,396 ounces of silver valued at \$239,524. Work started on the dredge and site on April 5 and finished on November 25.

Dredge No. 9 (5 3/4-cubic-foot buckets) is working upstream on upper Sulphur Creek about 2 miles south of the mouth of Green Gulch. In 1962 this dredge operated from May 10 to November 17, mined 346,181 cubic yards of gravel at a cost of 59.7 cents per cubic yard, and recovered 5,323 ounces of fine gold and 1,173 ounces of silver valued at \$188,822. Work started on the dredge and site on April 4 and finished on November 21. The stripping plant operated from May 27 to July 31 and removed 101,848 cubic yards of overburden at a cost of 15.4 cents per cubic yard. Work started on the plant and site on April 15.

#### Hunker Creek

Dredge No. 11 (7-cubic-foot buckets) is working down Hunker Creek, just over 1 mile below Last Chance Creek. In 1962 this dredge operated from May 3 to November 26, mined 930,410 cubic yards of gravel at a cost of 27.0 cents per cubic yard, and recovered 11,125 ounces of fine gold and 2,425 ounces of silver valued at \$392,354. Work started on the dredge and site on April 5 and finished on November 30. The thawing plant ahead of the dredge operated from June 6 to September 27 and thawed 808,843 cubic yards of gravel at a cost of 11.1 cents per cubic yard. Work on the plant and site started on April 20 and finished on October 21.

#### Exploration in the Yukon

The program in 1962 consisted of mapping the geology of 48 claims held in partnership with Asbestos Corporation (Exploration) Limited near Stand-to Hill (64°02'N, 135°10'W) in the Davidson Range (Nash Creek map-area, 106D) and of 13 claims of the wholly-owned Spotted Fawn Group (64°22 1/2'N, 138°42'W) in the Little Twelve Mile River area (Dawson map-area, 116 B and C (E 1/2)). A prospecting party examined an area at the head of Clear Creek (McQuesten map-area, 115P). A small prospect drilling program was carried out on the left limit of lower Dominion Creek opposite Granville and on Dominion Creek below Dredge No. 10 and above Burnham Creek.

#### Bonanza Creek

Cripple Hill Mining Company Limited (64°04'N, 139°21'W)

Reference: Skinner (1962, p. 8)

The Cripple Hill Mining Company Limited, owned by R. E. Troberg and P. Foth, has six creek claims on Bonanza Creek, one on Trail Gulch, three hill claims on Cripple Hill, and one on Trail Hill (all part of the old Bronson and Rae Concession) about 2 1/4 miles up the Bonanza Creek Road.

The company's first year of hydraulic mining in 1961 produced about 540 crude ounces of crude gold on the hill claims Nos. 77 and 78 Below Discovery. On the same ground from June 2 to October 7, 1962, a cut that was approximately 400 feet long by 150 feet deep by 100 feet high yielded about 720 crude ounces of gold. Typical gold is ragged, dark orange-yellow, commonly with adherent quartz grains, and runs about 800 in fineness.

Equipment used includes a D-6 bulldozer, 2 monitors, and 2 sluice-boxes that discharge over the edge of the bench. Water is supplied from Bonanza Creek by a 12-inch, 400 hp electric pump, which delivers 4,500 gallons per minute at 40 to 50 psi to a monitor.

With a maximum crew of five, gravels are hydraulicked through bedrock cuts to the sluice-boxes and the bedrock is scraped by the bulldozer. Big boulders must occasionally be broken by hand so that they will pass through the bedrock cuts.

The hydraulic pit is about 220 feet above Bonanza Creek in naturally thawed White Channel gravels. When the writers visited the property in September 1962, the face was about 100 feet high by 800 long, but not all of this had been mined during the year. Several old drifts at the base of the White Channel section on the bedrock have been uncovered. The gravel is poorly graded with cobbles generally irregularly shaped and under 6 inches maximum diameter. Schistose cobbles are often tabular, and locally show a common horizontal orientation. About 30 per cent of the boulders are white quartz. Sandy material consists of fine fragments of quartz-mica schist and about 30 per cent quartz grains. The section is stratified, as is emphasized by irregularly shaped horizontal sandy lenses, which are often several feet thick. The bedrock is well exposed in the cuts to the sluice-boxes and is deeply weathered grey mylonite with lenses of crushed quartz and quartz eyes up to 3 mm long. Some of the quartz eyes are bright blue.

A. T. Fry (63°57'N, 139°22'W)

References: Skinner (1961, p. 9; 1962, p. 9)

A. T. Fry owns two creek claims on Boulder Creek, two on Monte Cristo Creek, and owns and operates a hydraulic pit on three hill claims on King Solomon Hill, which is on the left limit of Bonanza Creek, 6 miles up Bonanza Creek Road.

From September 1959 till October 1961 Fry produced about 723 crude ounces of gold. In 1962 approximately 12,000 cubic yards of gravel were mined over the period from May 15 to October 1, yielding 196 crude ounces of gold. Typical gold is well worn, flat, and platy, and occurs commonly as grains up to 3 or 4 cm long and 1 to 2 cm thick. The largest nugget recovered by Fry was about 1 1/2 ounces. Fineness of this gold ranges from 785 to 800. Other heavy minerals include magnetite and cassiterite.

Equipment used includes a sluice-box, a monitor, and a RD-6 and D-7 bulldozer.

The gravel is washed through a bedrock cut to the sluice-box, which dumps northwards toward Boulder Creek. Boulders that are frequently 1 foot or more across must either be broken by hand (so they will pass through the bedrock cut) or stacked.

The hydraulic pit is in frozen White Channel gravels that are on a bedrock terrace about 190 feet above Bonanza Creek. When the writers visited the area in September a section of White Channel gravel about 40 feet high and 180 feet long was exposed in the cut. The gravels are about 20 per cent quartz and similar to those at Cripple Hill. A 2-foot thick sand layer about 10 feet from the bottom of the section seemed to be fairly continuous.

H.C. and D.F. Boutillier (63°56'N, 139°21'W)

References: Skinner (1961, p. 9; 1962, pp. 9-10)

H.C. and D.F. Boutillier own eleven creek claims on Adams Creek and four bench claims on Adams Hill, about 8 miles up and on the left limit of Bonanza Creek. Generally, the Boutilliers operate a hydraulic plant in White Channel gravels on Adams Hill in the spring when water is plentiful and a bulldozer-sluicing plant on Adams Creek during the summer. During the 1962 season, however, they restricted their activity to their sluicing operation on Adams Hill. In 1962 approximately 4,000 to 5,000 bedrock square feet were mined over the period from May 13 to September 20, yielding 196 crude ounces of gold.

Gravels on Adams Hill are fairly fine and about 40 per cent quartz. Few cobbles are over 8 inches long, and 2- to 3-foot thick sandy lenses are common. Gold is generally found at the base of the section on bedrock, but in part of the cut seemed to the authors to be concentrated on a layer of clay that was probably either a decomposed dyke or fault gouge.

Equipment used on Adams Hill includes a monitor supplied with water from about 3 1/2 miles up Adams Gulch, and a sluice-box that discharges over the bedrock terrace toward Bonanza Creek.

E. Lesaux and F. Perret (63°55'N, 139°12'W)

Reference: Skinner (1962, p. 10)

E. Lesaux and F. Perret have a 1/2-mile placer lease on Victoria Gulch, and lease claims No. 42 and No. 43 Above Discovery on Bonanza Creek (at the mouth of Victoria Gulch) from the Yukon Consolidated Gold Corporation. Their operation was washed out in the spring of 1962 when a dam on Upper Bonanza failed. They hope to be in production in 1963.

### Eldorado Creek

Ballarat Mines Limited (63°53'N, 139°16'W)

References: Skinner (1961, p. 10; 1962, p. 10)

Ballarat Mines Limited, owned by G.D. Franklin, of Seattle, Washington, and H. Schmidt of Healdsburg, California, is the second largest producer in the Dawson area, with a total production in excess of 5,000 ounces. During 1962, the company operated on Eldorado Creek for the entire season and on both Quartz and Dominion Creeks for part of the season. For descriptions of the other operations refer to the creeks concerned.

On Eldorado Creek, the company owns claims 29, 30, and 43-OA, leases claims 28 and 31 to 46A from Yukon Consolidated Gold Corporation, and claims 47 to 56 from J. Castonguay and D.M. Campbell. In 1962 the company mined ground on claims 32 to 35 that had been prepared the previous year and stripped most of the ground up to claim 44.

Equipment includes two D-8 bulldozers, a sluice-box, and a sled-mounted pump and monitor, which delivers 4,000 gpm through a 3 1/2-inch nozzle. The latter machine is very effective for stripping muck.

Eldorado Creek was the richest creek in the Yukon and, consequently, all the ground held by Ballarat Mining Company has been extensively worked - once underground and twice by open-cut methods. The company, however, is working a wider cut and cleaning the bed-rock. About 71,450 cubic yards were mined during the period June 7 to September 9, 1962, with a 3-man crew. The period from June to September, however, was not devoted entirely to sluicing. Stripping was carried out intermittently over the above period, and full-scale sluicing did not start until the beginning of July.

In the 1962 operation a working width of about 200 feet was mined. Muck contains the remains of Pleistocene animals and averages about 8 feet in thickness; this thickness, however, varies considerably. Gravels contain well-rounded, elongate, quartz-mica

schist cobbles, and some quartz cobbles. Muck and old mine timber are mixed with the gravel. The bedrock is platy quartz-mica schist, which locally is decomposed to a greenish clay.

### Hunker Creek and Tributaries

#### The Yukon Consolidated Gold Corporation Limited

Hunker Creek operations are described on page 44.

J. and I. C. Bremner (63°59'N, 139°08'W)

References: Skinner (1961, p. 10; 1962, pp. 10, 11)

J. and I. C. Bremner own 29 bench and hill claims and lease 9 creek and bench claims from G. M. Thompson on Lower Last Chance Creek, main tributary of lower Hunker Creek. In 1962, they worked a hydraulic pit in White Channel Gravels on Discovery Hill.

Approximately 6,500 bedrock square feet were mined over the period from April 20 to October 15, 1962, yielding 210 ounces of crude gold. Typical gold has a fineness of about 700, and is generally flaky; some nuggets with adherent quartz occur. Other heavy minerals include: silver, magnetite, ilmenite, cassiterite, monazite, and zircon.

Water is brought 5 miles from the forks of Last Chance Creek along a canal. The last section is piped, providing about a 40-foot head to a number 2 monitor. The only other equipment used is a sluice-box. Fortunately, the bedrock is so soft that tailings from the sluice-box generally cut bedrock drains to the edge of the bench. A maximum of 3 men are used in the operation.

When the writers visited the area in late September, a 30-foot section of White Channel Gravels was exposed in the cut on Discovery Hill. Cobbles are scattered throughout the section and are generally less than 6 inches maximum diameter. A few quartz boulders with a maximum diameter of 12 inches occur. Bedrock is rusty weathering altered volcanic rocks.

G. Fant and I. Norbeck (63°58'N, 139°00'W)

References: Skinner (1961, p. 10; 1962, p. 11)

G. Fant and I. Norbeck have a 5 claim (34 to 35C Below Discovery) prospecting lease on Hunker Creek about 3/4 mile below Gold Bottom Creek, and operate a hydraulic-sluicing plant on a low-level bench on the left limit of Hunker Creek on claims 34 to 35 Below Discovery.

An arcuate strip, 850 feet in length, is mined on a low level bench that is about 10 feet above the level of Hunker Creek. Approximately 319 ounces of crude gold were recovered in 1962. Typical gold is fine grained and is concentrated at the bedrock. Other heavy minerals include: magnetite, ilmenite, pyrite, and garnet.

Normally, during the spring run-off in May, water is ditched for 3 miles from middle Gold Bottom Creek, but during the remainder of the mining season it is pumped from Hunker Creek. Equipment used includes a 10-by-12-inch diesel-driven pump, several monitors, a sluice-box, and a TD-18 bulldozer.

In late September 1962, a 50-foot section was exposed. The top 40 to 45 feet was black organic muck containing abundant remains of Pleistocene animals and ice lenses that were up to 15 feet thick. The bottom 5 to 10 feet of the section was poorly sorted gravel. The sandy fraction contained abundant muscovite. Angular and platy cobbles, up to 6 inches maximum diameter, comprise about 25 per cent of the gravel. Old workings are abundant as suggested by old timbering, an old iced-up adit visible in the face of the cut, and tailings from shafts on the hill immediately above the cut. Bedrock is mined to a depth of about 3 feet and is composed of platy quartz-chlorite schist.

E. Schink (63°59'N, 139°03'W)

References: Skinner (1961, p. 11; 1962, p. 11)

E. Schink operated a small hydraulic operation on a bench claim on Paradise Hill, Hunker Creek. Production, during 1962, was about 31 ounces of crude gold.

Gold Bottom Creek

O. Lunde (63°55'N, 138°59'W)

References: Skinner (1961, p. 12; 1962, p. 14)

O. Lunde owns claims 10 to 17 and operated a sluicing plant on Gold Bottom Creek.

Lunde commenced work on Gold Bottom Creek in 1962, and from June 10 to October 1 mined about 23,500 bedrock square feet, which yielded about 225 ounces of crude gold. Typical gold is about 800 in fineness, well-worn, generally the size of wheat grains, but 10 to 15 per cent is nuggets up to 1/3 ounce in weight.

Stripping is done both with water and a D-6 bulldozer, and some ground has been prepared for 1963. The sluice-box is set at a 12 per cent grade.

At the time of the writers' visit in late September, the exposed section consisted of about 10 feet of silty muck containing abundant ice lenses underlain by 4 feet of poorly sorted gravel. The coarser fraction of the gravel is low in quartz, much of it consisting of subangular platy quartz-chlorite schist with cobbles up to 1 foot maximum diameter. The bedrock is quartz-chlorite schist and 1 to 1 1/2 feet of it is mined.

B. Bratsberg (63°54'N, 139°00'W)

References: Skinner (1961, p. 10; 1962, pp. 11, 12)

B. Bratsberg owns the upper 500 feet of Discovery claim and claims Nos. 3 to 12 Above Discovery, all on Gold Bottom Creek. His camp is on Discovery claim and may be reached by a 4.8-mile road along the right limit of Gold Bottom Creek.

In 1956, 1957, 1960, and 1961, Bratsberg mined his present holdings and produced about 1,060 ounces of crude gold. Three cuts that were about 100 feet by 100 feet were mined during 1962 and yielded about 102 ounces of crude gold. Most of the gold has apparently been removed by previous operators. Gold concentrated at bedrock is coarse, and ranges in fineness from 780 to 800.

Ground has been thawed and prepared for working in 1963, with the aid of a dam with an automatic gate.

The creek bed at the mining site is about 80 feet wide and contains about 10 feet of gravel overlain by up to 50 feet of frozen black muck. Old workings are extensive.

Dominion Creek and Tributaries

The Yukon Consolidated Gold Corporation Limited

Dominion Creek operations are described on page 42.

Ballarat Mines Limited (63°49'N, 138°40'W)

References: Skinner (1961, p. 11; 1962, p. 12)

Ballarat Mines Limited, owned by G.D. Franklin, of Seattle, Washington, and H. Schmidt of Healdsburg, California, is the second largest producer in the Dawson area with a total production in excess of 5,000 ounces. During 1962, the company operated on Eldorado Creek for the entire season and on both Quartz and Dominion Creeks for part of the season. For descriptions of the other operations refer to the creeks concerned.

On Dominion Creek the company owns creek claim No. 13 Below Lower Discovery, has a 1 1/4-mile lease above claim No. 9 Above Lower Discovery, and leases 48 claims from Yukon Consolidated Gold Corporation below the 1 1/4-mile lease.

The company has operated a bulldozer-sluicing plant since 1959 on the left limit bench of Dominion Creek between Nevada Creek and Coarse Gold Pup.

During the 1962 season, 56,000 cubic yards of gravel and bedrock were sluiced on the left limit immediately below Portland Creek on claims 35 to 38. In addition, 150,000 cubic yards of muck were stripped by both water and mechanical means. Typical gold is coarse, well worn, and about 817 in fineness. Other heavy minerals include: cassiterite, red garnet, and magnetite.

Equipment includes 2 bulldozers, and a sluice-box supplied with water by a monitor directed into the dump-box. Water at a rate of 2,000 gallons per minute is supplied to the monitor by a portable pump. Eight men were employed.

The bench being mined on the left limit is about 150 feet wide and appears to be about 10 feet above the level of Dominion Creek, but the operators report that the bench is actually about 30 feet above the level of the bedrock in the creek. Because of the abundance of old workings, the gravels are dirty and muck and timber are commonly mixed in the section down to bedrock. Where not previously mined, the muck is 10 to 15 feet thick with its lower part silty and laminated. The gravel is 5 to 6 feet thick and contains cobbles up to 1 foot maximum diameter. Bedrock is soft quartz-chlorite schist and is mined to a depth of 6 to 12 inches.

Plans for the coming year include the use of sprinklers for the removal of muck.

#### Gold Run Creek

J. Lamontagne and E. Schink (63°43'N, 138°39'W)

Lamontagne and Schink lease claims 36 to 51, excluding 45, on Gold Run Creek. These claims belong to and have been test-drilled by Yukon Consolidated Gold Corporation. The property is accessible from the Dominion Creek road by a 3-mile road along the left limit of Gold Run Creek.

Work on Gold Run Creek was commenced in 1962. Claims 36 to 39 were stripped and claim 36 was sluiced, but frozen ground limited the latter operation. During 1962 approximately 1,300 cubic yards were mined between May 1 and October 1, yielding about 162 crude ounces of gold. Typical gold is smooth and fine to coarse in



size. Other heavy minerals include: magnetite, generally as well formed octahedral crystals to 3 mm in maximum dimension, coarse scheelite, pyrite, and garnet.

Equipment includes two D-6 bulldozers, a sluice-box, and a pump and number 2 monitor mounted on a sled.

The ground has been extensively worked in previous hand operations. Abundant remains of wood fires for thawing ground were observed, and the section consists of a mixture of muck, gravel, and old timber. Gravel observed in the section contained only a few cobbles; these were generally less than 6 inches in maximum diameter. Visible bedrock in the creek was decomposed to a greenish clay. An outcrop near the camp, however, was fresh quartz-mica schist.

#### Caribou Creek

A. Burgelman (63°49'N, 138°49'W)

References: Skinner (1961, p. 11; 1962, p. 12)

Mr. and Mrs. A. Burgelman have creek claims Nos. 2, 3, 5 to 10, and 20 on Caribou Creek, which is one of the larger right-limit tributaries of Upper Dominion Creek. A bulldozer-sluicing plant was operated on the left limit on the upper part of claim No. 7 and stripping extended to claims 3 and 6 in preparation for the 1962 season.

Production in 1961 was 170 ounces of crude gold. In 1962 an area 100 feet by 540 feet was stripped, but as part of it was frozen, approximately 8,000 bedrock square feet were mined during the 1962 season yielding 165 ounces of crude gold. Typical gold occurs as spongy nuggets up to 1/2 ounce, which often have adherent quartz; only 15 to 20 per cent of the gold occurs as fine grains. The gold runs about 840 in fineness.

Equipment includes a D-6 bulldozer, a monitor, and a sluice-box.

The gravel is generally 3 or 4 feet thick and is overlain by about 15 feet of muck. A few old workings are present.

#### Quartz Creek

Ballarat Mines Limited (63°48'N, 139°06'W)

Reference: Skinner (1962, p. 12)

Ballarat Mines Limited, owned by G.D. Franklin, of Seattle, Washington, and H. Schmidt of Healdsburg, California, is the

second largest producer in the Dawson area with a total production in excess of 5,000 ounces. During 1962, the company operated on Eldorado Creek for the entire season and on both Quartz and Dominion Creeks for part of the season. For descriptions of the other operations refer to the creeks concerned.

The company operated a bulldozer-sluicing plant on Quartz Creek during part of 1962. Stripping on the creek was done in 1961, and from June to September 1962, approximately 100,000 bedrock square feet were mined on claims 30 and 31. Typical gold is very fine and has been difficult to recover. Recovery was greatly improved using mercury, and spreading the gravel thinly by splitting the finer gravel into 2 side boxes at the bottom end of the sluice-box. These side boxes recovered considerable gold.

The men and equipment, exclusive of the sluice-box were moved to Dominion Creek later in the season.

The cut mined during 1962 averaged about 17 feet in thickness, but was locally up to 30 feet thick. Gravels are similar to the White Channel Gravels of the Klondike area.

L.M. Fuhr (63°49'N, 139°04'W)

Reference: Skinner (1962, p. 14)

L.M. Fuhr owns a 1/2-mile lease on the right limit near Number 7 Camp and claims 3 to 18 Below A. Mack's Discovery on Quartz Creek. He operated a bulldozer-sluicing plant on 4 and 5 Below in 1962.

A maximum crew of 3 men moved approximately 15,000 bedrock square feet between May 15 and October 15, 1962, which yielded about 369 ounces of fine gold.

Equipment includes a TD-18 bulldozer, a sluice-box, and a steamboiler. The boiler was used for thawing in the spring of 1962, but was not satisfactory.

A. Sundt (63°50'N, 139°02'W)

Reference: Skinner (1962, p. 14)

A. Sundt owns a 1/2-mile lease on Little Blanche Creek (a tributary of Quartz Creek), and about 12 claims on Quartz Creek. In 1962 he operated a bulldozer-sluicing plant on claims 6 and 6A on a bench on the right limit of Quartz Creek immediately above Mack Fork.

Approximately 40,000 bedrock square feet were mined in two cuts within an area 200 feet by 800 feet, between June 10 and the

beginning of October, 1962. All the ground was not thawed. About 129 ounces of crude gold were produced. Typical gold is flaky and nuggets weigh up to 1/2 ounce.

Water is limited, but a dam enables 3 hours of sluicing after 18 hours of storage. Other equipment includes a D-8 bulldozer and a sluice-box.

The bedrock of the bench is about 25 feet above the bedrock in the creek. Muck thickness varies from about 3 feet on the bench to more than 10 feet in the creek. Gravel ranges in thickness from 10 to 25 feet and is dirty and silty. As boulders are generally absent, most of the tailings wash away and little stacking is required. Old workings are abundant and as much as 4 feet of tailings occur on top of the muck. Bedrock, composed of green decomposed schist, is uneven and commonly forms knolls with 10 feet of relief.

#### Eureka Creek

Eureka Placers Yukon Limited (63°34'N, 138°51'W)

Reference: Skinner (1962, p. 13)

Eureka Placers Yukon Limited (owned by G. Shaw, H. Hanulik, H. Buss, and Dr. J. Rooks of Dawson, Y.T.) own two Discovery claims, twenty-six claims on the right fork Above and Below Discovery on Eureka Creek, and a 3-mile prospecting lease on the left fork of Eureka Creek. The property is about 12 miles from Granville along a good access road.

In 1962 N. Ross and a helper mined ground on the left fork about 1/2 mile above the fork. Approximately 80,000 bedrock square feet were mined between May 1 and October 1, producing about 700 ounces of gold. Typical gold is fine, dark, dull, flattened, and runs about 720 in fineness. Because of inclusions of dark quartz it is unsuitable for jewellery. The largest nugget found weighed about 3/4 ounce. A D-7 and a D-8 bulldozer were used during operations and water was supplied from an earth-dammed pond with a ditch to the sluice-box. The sluice-box was about 30 inches wide, and had a 16 per cent grade. Mercury was used to catch fine gold.

The working width was about 100 feet across the stream at the time of the writers' visit. Gravel in the cut was about 5 feet thick and the overlying muck, 3 feet. The owners report that the gravel is typically 10 feet thick, the muck 5 feet thick. After stripping, a 7-foot thickness including 2 feet of bedrock was sluiced. All the ground has been extensively worked in the past resulting in a wide variation in the bedrock values between individual cuts. The ground is marginal, but the company expects workable values upstream to the forks.

Gravels are clayey, poorly sorted, and contain tabular boulders to 1 foot maximum diameter of grey micaceous quartzite and gneissic material. Iron oxide is abundant. Bedrock is grey micaceous quartzite with some quartz mica schist.

Northern Yukon Services Limited (63°35'N, 138°51'W)

Reference: Skinner (1962, p. 14)

Northern Yukon Services Limited is owned by M. D. and L. G. Cole of Dawson, Y. T. Placer ground is on Eureka Creek and is subleased from G. Shaw, H. Hanulik, J. Buss, and Dr. J. Rooks of Dawson, Y. T.

In 1962 the company worked the left limit below the fork on the Discovery claim, mining approximately 130,000 bedrock square feet from April 30 to October 1. About 630 ounces of gold were produced. The property is accessible from Granville along the same access road to Eureka Placers Limited.

Several D-8 bulldozers were used in conjunction with a dragline for piling tailings. A monitor was used for clearing most of the muck. Water for the sluice was supplied from the right fork of Eureka Creek by a ditch.

When the writers visited the area the ground was being prepared downstream for mining during 1963. The owners also plan to mine the left limit of the left fork.

In the 1962 operation a working width of about 200 feet was mined. The muck contains abundant remains of Pleistocene animals and is about 10 feet thick, but this thickness is very variable. Gravel underlying the muck is about 14 feet thick, but this too is variable. Muck and 6 feet of gravel were removed before mining underlying gravel and 2 feet of bedrock. There are old workings on benches in the vicinity, but the ground mined in 1962 had not been previously worked.

The gravels are clayey and poorly sorted, with cobbles generally platy, subrounded, and less than 6 inches in maximum diameter. Cobbles are mainly massive grey quartzite, but about 5 per cent of them are white quartz. Boulders are not common. Locally, sandy material is abundant.

Bedrock is locally decomposed and clayey; elsewhere it is mainly grey micaceous quartzite and quartz mica schist.

The gold is found at the base of the gravel and is generally coarse.

Germaine Creek

J. Werbiski (64°03'N, 138°55'W)

J. Werbiski has a 1-mile prospecting lease on a bench on the right limit of Germaine Creek. The property is readily accessible from the Stewart Crossing-Dawson City highway.

During 1962 approximately 7,000 bedrock square feet were mined from June to November. Difficulty with frozen ground was encountered. Production was 233 ounces of crude gold. Typical gold is worn, flat, and flaky. Cassiterite of the wood-tin variety is abundant.

Equipment includes a T-6 gas bulldozer and a sluice-box with pole riffles.

The muck varies in thickness, to a maximum of 15 feet. Gravels are 8 to 10 feet thick. Boulders in the gravel are well rounded and are generally about 1 foot maximum diameter. Boulders in the gravels include: quartz-pebble conglomerate (grit), blue-grey quartzite, diorite, syenite, and 'bull' quartz. Rock types represented in the boulders are prominent northeast of Tintina Trench (Green and Roddick, 1962) and were probably derived from that area. The bedrock is deeply weathered quartz-feldspar porphyry or rhyolite of probable Tertiary age.

All Gold Creek

K. and S. Placers Limited (63°57'N, 138°37'W)

Reference: Skinner (1962, p. 14)

K. and S. Placers Limited, owned by M. Kinakin and W. Scott of Dawson, operated a bulldozer-sluicing plant and leases Discovery claim and creek claims 1 to 10 on All Gold Creek from the De Coursey-Brewis Limited.

During 1962 approximately 50,000 cubic yards were mined with a D-6 bulldozer from May 15 to September 30, yielding 375 ounces of crude gold. One man was employed.

SIXTYMILE RIVER AREA

Miller Creek

O. Medby (approx. 64°00'N, 140°51'W)

References: Skinner (1961, p. 13; 1962, p. 15)

O. Medby operated a bulldozer-sluicing operation on Miller Creek, a tributary of Sixtymile River. During 1962 he worked alone and recovered approximately 150 ounces of crude gold.

## KIRKMAN CREEK AREA

### Kirkman Creek

L.N. Ross (63°01'N, 139°20'W)

References: Skinner (1961, pp. 13-14; 1962, pp. 15-16)

L.N. Ross owns creek claims 14 to 19 Below Upper Discovery and a 1-mile lease 2 1/2 miles above the mouth of Kirkman Creek; he leases three Upper Discovery claims and claims 1 to 5 Above and Nos. 1 to 6 Below Upper Discovery from Ballarat Mines Limited. Ross has operated a bulldozer-sluicing plant on Kirkman Creek since 1957. Production in 1962 was about 561 ounces of crude gold.

## CLEAR CREEK AREA

### Clear Creek

G. Heitman and H. Netzel (63°47'N, 137°17'W)

Reference: Skinner (1962, p. 16)

G. Heitman and H. Netzel operated a bulldozer-sluicing plant on Netzel's 2-mile placer lease below the main fork on Clear Creek. A crew of up to 7 men, using two D-6 bulldozers and a HD-14 bulldozer, recovered about 500 ounces of crude gold in 1962.

## MAYO MINING DISTRICT

### HAGGART CREEK AND DUBLIN GULCH AREA

#### Haggart Creek

Spruce Creek Placers (64°01'N, 135°51'W)

Reference: Skinner (1962, p. 18)

Spruce Creek Placers Limited, owned by F.M. Wilson, J.M. Acheson, and W.L. Drury, leased 22 claims from the E.H. Barker estate on Haggart Creek between Dublin Gulch and Fifteen Pup. They have also staked a 1-mile placer lease along the left-limit bench

below Dublin Gulch. The property is accessible by a 28.8-mile road from Proctor's Sawmill, which is beside the Mayo-Elsa road.

Managed by Acheson, Spruce Creek Placers have mined the ground since the end of September 1961. Production in 1961 was about 30 ounces of crude gold. Approximately 40,000 cubic yards were stripped and 33,864 cubic yards were sluiced between June and October 1962, yielding 889 ounces of crude gold. Typical gold is coarse and well worn but with smaller, fewer, and much smoother nuggets than are found in Dublin Gulch. Other heavy minerals include: rutile, pyrite, scheelite, magnetite, hematite, garnet, zircon, galena, and ferberite (?). At the end of July the company was commencing a prospect adit 1/2 mile downstream from its placer operation, on the left limit of the creek where Walter Malacky had exposed a deep section in 1961 (Skinner, 1962, p. 18).

Equipment includes an International TD-18, a caterpillar D-8, a 40-inch by 53-foot sluice-box, and a monitor and pump, which are mounted together on a sled and used for stripping muck.

#### Dublin Gulch

Double S Placers Limited (64°02'N, 135°49'W)

References: Skinner (1961, p. 14; 1962, p. 17)

Double S Placers Limited, owned and operated by G. Smashnuk of Mayo, has five claims above F. Taylor's on Dublin Gulch. He uses a sluice-box, a model 955 Traxcavator and, in conjunction with F. Taylor, a dam with an automatic gate.

From 1960, when he acquired the property, until the end of 1961 Smashnuk has produced about 700 crude ounces of gold. Approximately 4,000 cubic yards were mined between June and October 1962, yielding about 126 ounces of crude gold. Typical gold is coarse, rough, and wiry, similar to Taylor's. Smashnuk recovered one nugget weighing approximately 7 ounces, the largest found to date in Dublin Gulch. Other heavy minerals are the same as found on Taylor's property.

When visited by the junior author, Smashnuk was mining the left limit above Eagle Pup and was taking gravel from around a bedrock knoll. Gold was concentrated on the southern side of this knoll. The following section of the gravels was well exposed on the left limit near this knoll:

	Thickness in Feet	
	Unit	Total from base
Moss, spruce and undecomposed vegetation.	1	23
Peaty silt with some roots.	2	22
Pebble gravel, light buff in outcrop; abundant sand and silt, some large boulders, which are mainly phyllitic quartzite.	4	20
Silt, blue to rusty, with some organic material. This layer varies in thickness and pinches and swells irregularly.	2	16
Boulder gravel, with rounded boulders up to 4 feet maximum diameter. Pebble gravel between the boulders. Boulders are mainly granitic and generally very rotten, but some are phyllitic quartzite. Gold is found throughout this section with concentration under boulders and markedly at bedrock. Manganiferous zones occur at 11 feet and 13 feet from bedrock.	14	14

Bedrock is generally blocky-fracturing phyllitic quartzite.

F. Taylor (64°02'N, 135°50'W)

References: Skinner (1961, p. 14; 1962, p. 17)

F. Taylor owns five claims 0.6 mile above the mouth of Dublin Gulch and ground sluices on the left limit of the gulch immediately below the lower left-limit pup. The property is accessible by a 30-mile road from Proctor's Sawmill, which is beside the Mayo-Elsa road.

Taylor has mined the ground intermittently since 1936, producing about \$325,000 of gold, silver, and tungsten. During 1962 approximately 25,000 cubic yards were mined between May and October, yielding 935 ounces of crude gold. Typical gold is rough and wiry; about 10 per cent of it occurs as nuggets weighing up to an ounce



or more. The largest nugget found weighed 4 ounces. Other heavy minerals include hematite, scheelite, ferberite, arsenopyrite, jamesonite, garnet, and cassiterite.

Approximately 3 tons of tungsten concentrate were shipped in 1962. 'Heavies', cleaned of gold, were screened producing a 65 per cent WO<sub>3</sub> concentrate containing mainly scheelite and ferberite. Cassiterite, which is undesirable to this concentrate, is generally coarser grained than the tungsten minerals and is removed by screening.

Water supply in Dublin Gulch is limited. Consequently, Taylor, in conjunction with Double S Placers, uses an automatic gate-equipped dam, which takes approximately ten hours to fill and allows three hours of washing time. Other equipment used includes a Model 977 Traxcavator and a 36-inch by 30-foot sluice-box.

The creek bed at Taylor's cut is about 400 feet wide, is composed of quartzite and graphitic schist, and contains about 25 feet of coarse gravel overlain by about 5 feet of frozen muck. The section is similar to that on the adjoining property of Double S Placers Limited, described on page 58.

## HIGHET AND JOHNSON CREEKS AREA

### Highet Creek

E.C. Bleiler (63°46'N, 136°11'W)

References: Skinner (1961, pp. 15-16; 1962, p. 19)

E.C. Bleiler owns 36 placer claims and a 1-mile lease on Highet Creek. He operates a hydraulic-sluicing plant about 1/2 mile above his camp, which is at the mouth of Dredge Creek and 13 miles along the Highet Creek road from the Mayo road.

Between 1958 and 1961 Bleiler has recovered 506 ounces of crude gold from the right limit of Highet Creek. During 1962, approximately 8,500 cubic yards were mined between July 24 and October 11, yielding 224 ounces of crude gold. Typical gold is well worn and coarse with nuggets commonly weighing up to 3/4 ounce. Other heavy minerals include magnetite, hematite, scheelite, and ferberite.

Water supply is somewhat restricted and is enough to supply only one monitor under 150 feet of head. Other equipment includes a 955H Traxcavator, a TD-14 bulldozer, and a sluice-box with a perforated plate grizzly. The gravel being mined is monitored onto the grizzly. This grizzly affords the following advantages:

- (a) Sticky gold-bearing clay is broken up.
- (b) Large boulders are thoroughly washed of clay and discarded.
- (c) Only the fine material is passed through the grizzly. Sluice-box tailings, therefore, may be washed away avoiding stacking.
- (d) Better recovery of fine gold because boulder agitation of the gold in the riffles is eliminated.

When visited by the junior author early in August, Bleiler had just set up on new ground on the left limit of Hight Creek, and had started sluicing. The creek bed is about 200-feet wide and contains from 25 to 40 feet of a mixture of unfrozen gravel and boulders. Granitic, quartz-mica schist, and porphyritic volcanic rock boulders up to 3 feet in maximum diameter are common. Pebbles are frequently composed of schist and quartzite. Bedrock is mainly decomposed chlorite schist and is in places difficult to recognize. The gold is concentrated on the bedrock, of which about 2 feet is usually mined.

#### F. Erl (63°46'N, 136°13'W)

F. Erl owns 3 claims about 2 miles above E. Bleiler's camp. Erl works the ground on a part time basis only and commenced work in 1961. That year bedrock was not reached and only 8 ounces of gold were recovered. During 1962, approximately 900 cubic yards were mined between mid-July and the end of August, yielding 27 crude ounces of gold. Gold is fine and the 'heavies' contain more scheelite than those of Bleiler's ground downstream.

A poor supply of water limits the operation, but sluicing for about five minutes at a time is made possible by using a small storage canal and dam. Other equipment includes a 3-foot by 42-foot sluice-box and a HD-10 bulldozer.

#### Johnson Creek

#### Barduson Placers Limited (63°47'N, 136°21'W)

References: Skinner (1961, p. 16; 1962, p. 19)

Barduson Placers Limited, owned by K. Djukastein, J. Sandanger, and H. Barchen, operate a sluicing plant on Johnson Creek (about 1/4 mile below Sabbath Creek) using two bulldozers. The property is joined to E. Bleiler's camp by about 6 miles of rough road.

From 1958 to 1961 about 2,863 ounces of crude gold were produced. During 1962 approximately 55,000 cubic yards were stripped and 40,000 cubic yards were sluiced between May 15 and October 20, yielding about 1,411 ounces of crude gold. Typical gold is coarse. The largest nugget found weighed 4 ounces, 17 pennyweight.

The stream bed is about 150 feet wide at the present site and gravel is about 15 feet deep. The operators believe that the pay streak runs close to the centre of Johnson Creek and is concentrated over widths varying from 100 to 150 feet, that is, over the entire stream bed. The gravel is coarse, containing granitic and quartzite boulders up to 3 feet maximum diameter, and pebbles of white quartz and quartz sericite schist.

#### OTHER AREAS OPERATED

##### Thunder Gulch

W. Malacky (63°54'N, 135°15'W)

W. Malacky and H. Harach operated a sluicing plant on a lease in Thunder Gulch. They worked for several weeks late in 1962 with a D-8 bulldozer and recovered about 16 ounces of crude gold.

##### Duncan Creek

Reference: Skinner (1962, p. 20)

There were two small operations on Duncan Creek. The Blick Finnegan Syndicate held a 1-mile lease covering the Duncan Creek Canyon. The late Mr. Finnegan shipped 2 1/2 ounces of crude gold, which were obtained by hand picking the bedrock of the canyon when the water level was low. Farther upstream, A. Bobcik held a 1-mile lease and shipped 9 ounces of crude gold.

#### WHITEHORSE MINING DISTRICT

##### KLUANE LAKE AREA

##### Bullion Creek

Action Mining Company (61°01'N, 138°43'W)

References: Skinner (1961, pp. 17-18; 1962, p. 21)

Action Mining Company, owned by J.P. LaCross and J. Kelley of Fairbanks, Alaska, did no work on Bullion Creek in 1962. Late in August, the company moved its equipment to placer ground in the Atlin district, British Columbia.

### Burwash Creek

Burwash Mining Company Limited (61°23'N, 139°15'W)

References: Skinner (1961, pp. 16-17; 1962, pp. 20-21)

Burwash Mining Company Limited owns 22 claims, and operates a sluicing plant on claim 13, which is 5.8 miles from the Alaska Highway along the Burwash Creek road.

From 1945 to 1961 the company has recovered about 18,500 ounces of crude gold. In 1962, H. Besner, president and operations manager of the company, directed three men working one shift a day. They mined approximately 60,000 cubic yards of gravel between June 21 and October 22, yielding 1,637 crude ounces of gold. The gold is flattened, polished, and coarse, with nuggets commonly up to 4 ounces. The two largest nuggets recovered weighed 12 and 16 ounces. Other heavy minerals include magnetite, hematite, copper, silver, and platinum-group metals.

Equipment includes a 3/4 cubic-yard Bucyrus-Erie diesel shovel and two D-8 bulldozers. The diesel shovel moves the gravel onto a grizzly over a 50-foot sluice-box, and the bulldozers are used for stripping overburden and stacking tailings.

Burwash Creek valley is about 200 feet wide, but within it the operators report a deeper channel, which is generally about 50 feet wide and 15 feet deep. When the writers visited the area in 1962 a 23-foot section of gravel, with gold concentrated in the lower 6 feet, was being mined. Boulders chiefly of porphyritic volcanic rock are up to 1 foot maximum diameter, and generally well rounded. The creek has a sharp kink immediately above the site of the present operation. Good placer ground upstream to Tatamagouche Creek is indicated by samples from prospect shafts. Bedrock is composed of altered volcanic rock. One foot of the bedrock is mined where it is soft, but more is mined where it is fractured and blocky, because the gold tends to settle into crevices.

P. and G. Placers Limited (61°24'N, 139°14'W)

Reference: Skinner (1962, p. 21)

P. and G. Placers Limited, A.H. Clark, W.L. Drury, and R.O. Davis, all from Whitehorse, operated a sluicing plant on a lease on Burwash Mining Company's claim 22. This claim is 5.2 miles

from the Alaska Highway along Burwash Creek road.

Most of the left and right limits of Burwash Creek were mined by Burwash Mining Company, leaving a pocket in the centre which, at the time of the writers' visit, was being mined by P. and G. Placers Limited. Two men with a D-7 and D-8 bulldozer mined approximately 22,500 cubic yards from July 15 to September 10, 1962, yielding 149 ounces of crude gold. The company will be inactive in 1963.

The gravel contains some very large boulders, but most of the boulders are about 2 feet in maximum diameter.

## CARMACKS AREA

### Nansen Creek

T. Wheeler (62°06'N, 137°12'W)

T. Wheeler operates a bulldozer-slucing plant on a 1-mile lease on the east fork of Nansen Creek. He produced about 35 ounces of crude gold during 1 1/2 months in the summer of 1962.

COAL MINING

WHITEHORSE MINING DISTRICT

CARMACKS AREA

Tantalus Butte Mine (62°08'N, 136°16'W)

References: Bostock (1936a, pp. 59-62); Skinner  
(1961, p. 30; 1962, p. 30)

The Yukon Coal Company Limited, which is owned by Territorial Supply Company Limited, a subsidiary of United Keno Hill Mines Limited and Cassiar Asbestos Corporation Limited, operates the Tantalus Butte coal mine under management of United Keno Hill Mines Limited. The mine is at Carmacks, about 100 miles north-northwest of Whitehorse. The Tantalus Butte mine has operated since about 1923, except for the years 1939 to 1948. The Yukon Coal Company was formed in 1947 and the mine reopened in 1948. Production by Yukon Coal Company Limited from 1948 to 1962 inclusive was 101,711 tons. Annual production during this period has varied from less than 4,000 tons to a maximum of 14,113 tons in 1954. In 1962, production was 7,650 tons, which, with the exception of about 50 tons, was used by United Keno Hill Mines Limited at Elsa and Calumet.

REFERENCES

- Aho, A. E.  
1962: Report from Mayo; Western Miner and Oil Review,  
October, 1962, p. 82.
- Baragar, W. R. A., and Hornbrook, E. H. W.  
1963: Mineral Industry of District of Mackenzie and Part of  
District of Keewatin, 1962; Geol. Surv., Canada,  
Paper 63-9.
- Bostock, H. S.  
1935: The Mining Industry of Yukon, 1934; Geol. Surv.,  
Canada, Memoir 178.
- 1936a: Carmacks District, Yukon; Geol. Surv., Canada,  
Memoir 189.
- 1936b: Mining Industry of Yukon, 1935; Geol. Surv., Canada,  
Memoir 193.
- 1937: Mining Industry of Yukon, 1936; Geol. Surv., Canada,  
Memoir 209.

Bostock, H.S. (Cont.)

- 1938: Mining Industry of Yukon, 1937; Geol. Surv., Canada, Memoir 218.
- 1939: Mining Industry of Yukon, 1938; Geol. Surv., Canada, Memoir 220.
- 1941: Mining Industry of Yukon, 1939 and 1940; Geol. Surv., Canada, Memoir 234.
- 1957: Yukon Territory, Selected Field Reports of the Geological Survey of Canada, 1898 to 1933; Geol. Surv., Canada, Memoir 284.

Boyle, R.W.

- 1956: Geology and Geochemistry of Silver-Lead-Zinc Deposits of Keno Hill and Sourdough Hill, Yukon Territory; Geol. Surv., Canada, Paper 55-30.
- 1957: The Geology and Geochemistry of the Silver-Lead-Zinc Deposits of Galena Hill, Yukon Territory; Geol. Surv., Canada, Paper 57-1.

Brown, C.J.

- 1961: The Geology of the Flat River Tungsten Deposits, Canadian Tungsten Mining Corporation Limited; Bull. Can. Inst. Mining Met., vol. 54, pp. 510-513.

Cockfield, W.E.

- 1928: Silver-Lead Deposits of Fifteenmile Creek, Yukon; Geol. Surv., Canada, Summ. Rept., 1927, Pt. A, pp. 8A-18A, and in Bostock (1957, pp. 576-578).

Conwest Exploration Company Limited

- 1963: Twenty-fourth Annual Report for the Year Ended December 31, 1962.

Dominion Bureau of Statistics

- 1957: Canadian Mineral Statistics, 1886-1956; Reference Paper No. 68.

Geological Survey of Canada

- 1962a: Aeromagnetic Series Map 1413G, Whitehorse, Yukon Territory, 105 D/11.
- 1962b: Aeromagnetic Series Map 1412G, Upper Laberge, Yukon Territory, 105 D/14.
- 1962c: Aeromagnetic Series Map 1341G, MacRae, Yukon Territory, 105 D/10.

- Green, L.H., and McTaggart, K.C.  
1960: Structural Studies in the Mayo District, Yukon Territory; Proc. Geol. Assoc., Canada, vol. 12, pp. 119-134.
- Green, L.H., and Roddick, J.A.  
1961: Nahanni, Yukon Territory and District of Mackenzie; Geol. Surv., Canada, Map 14-1961.  
1962: Dawson, Larsen Creek, and Nash Creek Map-areas, Yukon Territory; Geol. Surv., Canada, Paper 62-7.
- Hume, G.S.  
1954: The Lower Mackenzie River Area, Northwest Territories and Yukon; Geol. Surv., Canada, Memoir 273.
- Jenness, S.E.  
1963: Summary of Research: Field, 1962; Geol. Surv., Canada, Paper 63-1.
- Johnston, J.R.  
1937: Geology and Mineral Deposits of Freegold Mountain, Carmacks District, Yukon; Geol. Surv., Canada, Memoir 214.
- Kindle, E.D.  
1953: Dezadeash Map-area, Yukon Territory; Geol. Surv., Canada, Memoir 268.  
1962: Keno Hill, Yukon Territory; Geol. Surv., Canada, Map 1105A with Descriptive Notes.  
1963: Whitehorse Copper Belt, Yukon Territory; Geol. Surv., Canada, Map 49-1962.
- MacLean, T.A.  
1914: Lode Mining in Yukon: An Investigation of Quartz Deposits in the Klondike Division; Canada Dept. Mines, Mines Branch, Pub. 222.
- McTaggart, K.C.  
1960: The Geology of Keno and Galena Hills, Yukon Territory (105 M); Geol. Surv., Canada, Bull. 58.
- Mertie, J.B., Jr.  
1932: The Tatonduk-Nation District, Alaska; U.S. Geol. Surv., Bull. 836-E.
- Poole, W.H., Roddick, J.A., and Green, L.H.  
1960: Wolf Lake, Yukon Territory; Geol. Surv., Canada, Map 10-1960.



Roddick, J.A., and Green, L.H.

- 1961: Sheldon Lake, Yukon Territory; Geol. Surv., Canada,  
Map 12-1961.

Skinner, R.

- 1961: Mineral Industry of Yukon Territory and Southwestern  
District of Mackenzie, 1960; Geol. Surv., Canada,  
Paper 61-23.

- 1962: Mineral Industry of Yukon Territory and Southwestern  
District of Mackenzie, 1961; Geol. Surv., Canada,  
Paper 62-27.

United Keno Hill Mines Limited

- 1961: Current Operations at United Keno Hill Mines;  
Bull. Can. Inst. Mining Met., vol. 54, pp. 722-739.

- 1962: Annual Report for the Year Ended September 30, 1962.

Wheeler, J.O., Green, L.H., and Roddick, J.A.

- 1960: Finlayson Lake, Yukon Territory; Geol. Surv.,  
Canada, Map 8-1960.

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