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DESCRIPTION OF DEPOSITS.

Pinchi Lake

The mercury property at Pinchi Lake (Plate I A) owned by the Consolidated Mining and Smelting Company of Canada, Limited, comprises the following mineral claims: Mercury Nos. 1 to 3, Pinchi Nos. 1 to 4, Dugout Nos. 1 to 8, Chief Nos. 1 to 2 and fractions.

The discovery of cinnabar was made in the summer of 1937 by J. G. Gray of the Geological Survey of Canada, and is described by him on p. 9 of Paper 38-14, 1938. However, the original claims, the Mercury Nos. 1 to 3, were not staked until May, 1938, by A. J. Ostrem, George Nielson and A. R. Brown; these were optioned in that year by the Consolidated Mining and Smelting Company of Canada, Limited, and the remaining claims staked the same year. Since that time this company has erected a comfortable camp on the northern shore of Pinchi Lake (Plate I A).

The discovery showings are along the top of a prominent limestone ridge 700 feet above and adjacent to the northern shore of Pinchi Lake approximately 6 miles from the northwestern end of the lake.

The property may be reached from Fort St. James at the southern end of Stuart Lake, by one of two land-water routes. Of these the better and the one in common use in 1939, is via Stuart Lake for 13 miles to Pinchi Lake Indian Reserve, thence by an unimproved wagon-road on good grade for 4 1/2 miles to the southern shore of Pinchi Lake. From this point the distance by water is about 2 miles to the company's camp on the northern shore of the lake, behind a small island, beneath the showings. Alternatively, the property may be reached by a trail and poor wagon-road, 8 miles in length, branching westerly from the Fort St. James-Manson Creek road at a point about 17 miles north of Fort St. James, and connecting with a point on the northern shore of Pinchi Lake, about 7 miles distant by water from the company's camp. By far the quickest way to reach the property, however, is by airplane from Fort St. James, where planes are usually obtainable. The air-line distance is about 15 miles.

The Pinchi Lake cinnabar deposit consists of a cinnabar-bearing fracture-zone that cuts a series of dynamically metamorphosed sediments. The rocks include limestone, cherty quartzite, quartz-mica schist and a little glaucophane schist.

These rocks strike more or less uniformly north-westerly and dip north-eastward, but in the vicinity of the showings they have been warped into a structure that the writer interprets as a combined anticline and syncline that strikes northerly and plunges from 25 to 60 degrees in the same direction. The fracture-zone strikes north 60 to 70 degrees west, at times parallel to the bedding but cutting across the strike of the folds. This fracture-zone is characterized underground by extreme faulting and associated brecciation over widths ranging from 6 inches to 4 feet, and, characterized on the surface by disconnected outcrops of brecciated chert, the widths of brecciation ranging from 2 to 10 feet. The length of the fracture-zone, but not of uniform mineralization, may be summarized as follows:

(1) Length of definite fault-zone and associated brecciation as seen in the main drift of the north adit - 230 feet (as of June 11, 1939).

(2) Length of fracture-zone in the showings on Discovery Hill as indicated by fairly closely-spaced strippings and outcrops exposing brecciated rock - 750 feet.

(3) Overall distance between outcrops of brecciated rock at extremities of partly-prospected area and separated by long unprospected areas of drift - 4,000 feet.

Cinnabar occurs most abundantly in highly-brecciated fault or fracture-zone material of both the south-easterly and north-westerly workings over widths corresponding to those of the fracture-zone, and, in cherty quartzite of the north-westerly workings over widths ranging from 1 inch to 4 feet.

The showings are along the top of a limestone ridge, approximately 700 feet high that parallels the north shore of the lake. The southerly slope of the ridge begins to rise steeply a few hundred feet back from the wooded shore of the lake and rises on a slope ranging from 25 to 30 degrees to a relatively round-topped ridge at 700 feet above the lake. For the most part, the hillside consists of talus slopes and low bluffs, clothed in part by a dense covering of small timber. The showings themselves are on the highest knoll of the ridge and on the north-westerly slopes of a lower knoll approximately one-quarter of a mile north-westerly. The ground in the immediate vicinity of the discovery-showings constitutes the rounded top of the ridge, approximately 200 feet in width, and breaking off to steep talus slopes on either side.

The workings consist of 2 adits, a North and a South, of which the North adit (Plate I B) is the more important, and strippings and trenches (see Fig. 1).

In the following descriptions, when it is necessary to locate points, they can be found in one of three ways:

(1) By reference to the trench number as it appears on Fig. 1.

(2) By reference to either one of the two adits, the North adit, or the South adit.

(3) By reference to a grid system of co-ordinates with the origin near the portal of the North adit. It is to be noted that this grid has not been laid out on the ground, it is for plan reference only. (See Fig. 1.)

The hill referred to as Discovery Hill in the description trends north-westerly and the round top of it lies between the North and South adits. The discovery of cinnabar was made on this hill.

The rocks, in and adjacent to the area of the workings comprise: unaltered and altered crystalline limestone, micaceous, cherty quartzite, quartz-mica schist, glaucophane schist, serpentine and andesitic greenstone. With the exceptions of the serpentine and greenstone the rocks form a group of dynamically metamorphosed sediments that strike north-westerly and dip north-eastward, except where disturbed by minor warping in the vicinity of the ore-zone. The sequence from the lake shore north-easterly across the strike towards Discovery Hill is as follows: first, a lake-shore band of unaltered and unmineralized, crystalline limestone, approximately 300 feet in exposed width; second, a band of schist, approximately 1,000 feet in width, although this is mostly quartz-mica schist, a band of glaucophane schist of an indicated width of only 150 feet, occurs on the south-west adjacent to the limestone; third, a lens of laminated, micaceous, cherty quartzite, the scattered exposures of which indicate a width of approximately 300 feet in the widest part; fourth, a thin lens of limestone that is approximately 40 feet wide in the vicinity of a point 800 feet south and 100 feet east of the north adit (see Fig. 1), but narrows to a few lone outcrops north-westerly in the vicinity of 0 feet south and 600 feet west; fifth, a thin band of limy quartz-mica schist of variable width, but approximating 100 feet, and lastly, a band of highly-altered, mineralized limestone approximately 400

feet in exposed width and forming the top of Discovery Hill. Serpentine forms the bulk of Pinchi Mountain, the south-westerly slopes of which begin approximately 2 miles north-westerly from the North adit. Serpentine also occurs at a point approximately 1700 feet south and 2400 feet east of the North adit (see Fig. 1), where it forms a lone outcrop in a large drift-covered area. Andesitic greenstone occurs as the main rock of a low hill approximately 1500 feet north-easterly from the North adit.

As previously stated, there are two main bands of limestone and one small lens. A band of unaltered limestone, approximately 300 feet in exposed width, extends north-westerly along the north-easterly shore of Pinchi Lake, and a band, approximately 400 feet, in exposed width of altered mineralized limestone, forms the crest of Discovery Hill approximately 1700 feet north-easterly across the strike from the lakeshore-band. A narrow lens of relatively unaltered limestone occurs on the south-westerly slope of Discovery Hill between laminated cherty quartzite on the south-west and quartz-mica schist on the north-east. This lens is approximately 40 feet wide at a point 800 feet south and 100 feet east of the North adit (see Fig. 1), but narrows to a few outcrops, largely silicified, in the vicinity of a point 600 feet west of the portal of the North adit.

Where relatively unaltered, the limestone is white or more commonly mottled-grey and white; it is definitely crystalline and of medium-grain. The complete recrystallization of the limestone has destroyed all evidence of bedding, except where preferential chertification has given the rock a banded appearance, the colour bands corresponding to the original bedding-planes of the limestone.

Although the rock in the lakeshore-band of limestone has been relatively unaltered, on Discovery Hill it has been extensively altered by silicification and ankeritization.

Silicification has resulted in the formation of irregular areas of massive chert and areas in which chert-ribbons alternate with thin limestone bands. Massive chert occurs in three main areas, first, a very conspicuous bluff above the South adit, second, a low bluff extending from the vicinity of 200 feet south to 200 feet east, and a third area of scattered but probably connected occurrences in Nos. 6 to 10 trenches of the north-westerly group of trenches. Ribbon-chert is very sporadic in its distribution and occurs in patches indiscriminately scattered within areas of limestone; there is a tendency, however, for this type of silicification

to be more prevalent in the transition-zone between the limestone band of Discovery Hill and the quartz-mica schist to the south-west.

Where well-developed, the chert is very massive and conspicuously jointed by closely-spaced fractures, so that outcrops produce an abundant talus of small angular fragments. The chert varies from white to smoky-grey in colour and in places has a definite colour-banding ranging from 1 inch to 3 inches in width, which reflects original bedding planes in the replaced limestone; folding, particularly drag-folding, is often plainly visible in such colour-banded chert. The ribbon-chert differs from the massive chert only in habit; instead of as large areas of uniformly massive material, it occurs within limestone as parallel, sinuous ribbons ranging from 1/2 an inch to 2 inches in thickness and separated by 1/2 an inch to 2-inch bands of either unaltered or ankeritized limestone.

Most of the chert lying along the strike of the main fracture-zone has been conspicuously brecciated. Outcrops of such material recognizable by their hackly surface, are formed as a result of the difference in resistance to weathering as between the broken pieces of chert. The chert fragments range from pieces barely visible to the naked eye to pieces 1 inch in maximum dimension. They are very angular and are set in a matrix of finely-pulverized material, usually consisting of angular, strained quartz grains, but often containing some sericite. Fragmental chert occurs occasionally in a limestone matrix, the carbonate grains showing conspicuous cleavage-plane slips. The brecciation of the chert is probably related to movements along the main fracture-zone which probably gave access to the solutions responsible for the silicification, or chertification, of the limestone.

The limestone in an irregular area along the strike of the main fracture-zone has been varyingly altered to masses of ankeritic carbonate. Such alteration, is marked by buff to brownish-weathering outcrops which are in distinct contrast to the white and light-grey outcrops of the unaltered limestone. Slight alteration is marked by mottled-brown and white surface, and more complete alteration by more uniformly brown surfaces. The ankeritized limestone is crystalline and massive to the same degree as the unaltered limestone, but it tends to be finer-grained. Relict areas of ribbon-chert within areas of ankeritized rock indicate that ankeritization was a later process than silicification. Its areal distribution indicates that ankeritization is related spatially to the fracture-zone, which probably served as a channel for the al-

tering solutions.

Ankeritization as seen in the North adit, does not extend into the hanging-wall of the fracture-zone, but extends into the foot-wall for a considerable distance. The alteration is intense for 20 feet into the foot-wall, and then becomes spotty and much less intense for the remaining distance of 120 feet to the portal.

Cherty quartzite, commonly containing enough mica to impart a definitely laminated habit to its texture, occurs in scattered outcrops that suggest a lens-shaped body extending southerly and south-easterly from the north-westerly showings and narrowing from approximately 300 feet at the northerly end to a few scattered outcrops, toward the south, in the vicinity of a point 500 feet south to 300 feet west of the North adit (see Fig.1). Both massive and laminated quartzite occurs in the North adit in a short working that extends for 25 feet south-westerly from a point 35 feet from the face. Sandy quartzite occurs as a lenticular band ranging from 1 inch to 18 inches in thickness over a length of approximately 80 feet in No. 12 trench. The material in this band consists of light-coloured, sugary quartzite, mottled brown by rusty-weathering carbonate grains evenly scattered through the rock. The quartz grains range from medium to fine in size and all show the effects of dynamic metamorphism in either strain-shadows or granulation of the grains; all evidence of original sand grains has been destroyed. This crushed quartzite contains an abundance of evenly-disseminated cinnabar grains.

The well-laminated quartzite consists of 1/4-inch to 1/2-inch bands of cherty quartzite separated by thin layers or partings of fine, white mica. Where adjacent to limestone, 1/16 to 1/8 of an inch layers of lime frequently alternate with the quartzite.

The quartzite probably represents a purer and less argillaceous sandstone than the quartz-mica schist.

Limy phases of the schist occur along the south-westerly border of the Discovery Hill limestone band; some of these contain so much carbonate, frequently ankeritic, that they are perhaps better called lime-schists.

The main body of quartz-mica schist occurs as a band approximately 1,000 feet in width, that lies between and is conformable with the two main bands of limestone. Scattered outcrops of this schist-band extend along the strike for a minimum distance of 12,000 feet from an outcrop at a point which

is 700 feet south and 1,200 feet west of the North adit (see Fig. 1) to an outcrop at a point which is 6,000 feet north and 8,500 feet west of the North adit (see Fig. 1). In this distance the strike varies from north 80 degrees west to north 45 degrees west and the dips from 45 degrees to 60 degrees northward and north-eastward. A second narrow band of schist, approximately 100 feet in width, occurs between the Discovery Hill band of limestone and the limestone-lens to the south-west; in addition to the quartzose phase, the schist of this band tends to be limy in some outcrops near the main limestone.

The quartz-mica schist is characterized by whitish-weathering outcrops of schistose rock, the schistosity of which is frequently badly contorted. The rock itself, consists of lens-shaped aggregates of quartz grains surrounded by finer grains of quartz and by weaving shreds of fine-grained white mica. The quartz-grains all show strain-shadows, are badly fractured and have been largely broken into the smaller angular grains that form the matrix for the larger grains. A small amount of material was noticed in which granulation was so advanced that the schistose texture had given way to a definitely-laminated habit.

Light-green, highly micaceous schist occurs as squeezed lenses in the limestone of the main crosscut of the North adit and towards the westerly end of No. 5 trench. In general, the material of these lenses is very micaceous and contains little quartz and carbonate; the lenses probably represent argillaceous material, that has been squeezed and has flowed into lenses during folding of the enclosing limestones.

A small amount of light-green schist containing an abundance of lime and some quartz occurs in the North adit in a short working that extends for 25 feet south-westerly from a point 35 feet from the face of the main crosscut and in the face of the west drift in the same adit; this schist has not been squeezed to the same extent as the more purely micaceous.

Outcrops of glaucophane schist were seen in the vicinity of a point 1500 feet north to 4000 feet west of the North adit and on the south-westerly side of the main quartz-mica schist band. The outcrops form part of a band approximately 150 feet in width that lies in a slight depression adjacent to and north-easterly from a prominent bluff of the lake-shore limestone band. Quartz-mica schist lies adjacent to the glaucophane schist on the north-east. The rock is dark-grey in colour, finely schistose, but badly crumpled and sheared. It consists of shreddy glaucophane wrapping around badly sheared and broken pyroxene and olivine.

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A small amount of glaucophane was seen in an outcrop of [illegible] schist in the vicinity of 800 feet south to 1200 feet west or approximately 2800 feet south-easterly along the general direction of strike from the last-mentioned occurrence. There may be a stratigraphic connection between the two occurrences, but this is not definitely shown.

Serpentine occurs as an isolated outcrop, surrounded by drift on all sides, in the vicinity of a point 1700 feet south and 2300 feet east of the North adit. The outcrop forms a south-westward-facing escarpment, approximately 40 feet high on the westerly and northerly faces; with a semi-circular length of approximately 700 feet.

The nearest outcrops, with the exception of one small chert outcrop 150 feet south-westerly from it, are those of the Discovery Hill limestone, 1500 feet north-westerly.

The outcrop consists mostly of buff-coloured, reddish-weathering serpentine that has been completely silicified and carbonatized. However, unaltered serpentine, or definitely green serpentine, occurs in small patches on the north-easterly periphery of the outcrop.

The altered serpentine is light buff-coloured and frequently spotted with light green clusters of mariposite and occasional grains of chromite; the exposed surfaces weather to a characteristic reddish-brown, hackly surface. The rock consists of lenses and streaks of shreddy carbonate grains alternating with streaks of fine to medium-sized grains of quartz. The quartz grains are clear, relatively unstrained and unbroken; the cataclastic texture common to the schist and quartzite, is lacking. This suggests that the development of quartz in the serpentine is later than the main folding of the sedimentary rocks and also later than the crushing associated with the main fracture-zone, which, combined with the occurrence of occasional 1/8 to 1/4 of an inch slabs of cinnabar, suggests the proximity of this serpentine outcrop to the fracture-zone responsible for both silica-bearing and mercury-bearing solutions.

Although greenstone does not occur in the immediate vicinity of the workings, it forms a low hill that lies approximately 1500 feet north-easterly from the North adit. This occurrence constitutes the south-westerly side of a north-westerly-trending band of greenstone.

Regionally the main structure is a belt of dynamically metamorphosed sedimentary rocks that strikes north-westerly

and dips north-eastward, forming part of a limb of a major fold, the remaining parts of which do not come within the present map-area. Locally, however, in the vicinity of the ore showings, this limb has been warped into what the writer interprets as a small anticline and syncline that plunges northward diagonally down the regional dip.

A study of strikes and dips of bedding-planes, and of the relation of the axial planes of several small drag-folds to bedding, has led to the conclusions that - (1) warping has resulted in a combined anticline and syncline, the crest and trough of which are in the vicinity of No. 12 trench, and the south-westerly end of No. 20 trench (see Fig. 1), respectively; (2) these folds strike northerly and plunge in the same direction at angles ranging from 25 degrees to 60 degrees.

The second important structural feature is a strong cinnabar-bearing fracture-zone, marked underground by conspicuous faulting, and brecciation ranging from 6 inches to 4 feet in width, and marked on the surface by a zone and scattered outcrops of brecciated chert. The strike of the faulting underground and of the zone of brecciated outcrops on the surface, ranges from north 60 degrees west to north 70 degrees west, and dip of the faulting from 45 degrees to 65 degrees south-westward. Although the strike of this zone is nearly parallel to the bedding in some places, particularly in the drift of the North adit, it cuts the bedding elsewhere, and in general is transverse to the axial direction of the local anticline and syncline.

The zone of outcrops of brecciated chert, and in places of brecciated limestone varies from 2 to 10 feet in width. Outcrops of brecciated chert occur on the general strike of the fracture-zone from No. 14 trench south-easterly to No. 20 trench, as seen in Fig. 1; this zone very probably continues approximately 2000 feet south-easterly to an outcrop of definitely-brecciated chert that occurs 150 feet south-westerly of the cinnabar-bearing serpentine knoll mentioned in the description of the rock-types.

The nature of the lineal extent of the fracture-zone may be summarized as follows:

(1) Length of definite fault-zone and associated brecciation, as seen in the main drift of the North adit - 230 feet (as of June 11, 1939).

(2) Length of fracture-zone as indicated by fairly closely-spaced strippings and outcrops of brecciated rock - 750 feet.

(3) Overall distance between outcrops of brecciated rock at extremities of partly-prospected area and separated by long, unprospected areas of drift, approximately 4000 feet.

The north-westerly extremity of prospecting done on this partly-mineralized fracture-zone, is marked by No. 14 trench, where cinnabar occurs in brecciated rock associated with a vertical shear. The south-easterly extremity is marked by an outcrop of brecciated chert, 150 feet south-westerly of occurrences of cinnabar in altered serpentine.

The distribution of cinnabar is more or less coincident with the fracture-zone. The heaviest concentrations of cinnabar occur where brecciation and shearing of the fracture-zone material appears most intense and the limestone most siliceous. This type of ore consists predominantly of scattered grains and clusters of grains, and, to a less extent, of uniform mineral sheets. The cinnabar also occurs in weaving wisps or streamers of variable width within very finely-comminuted material between larger breccia-fragments. The ore-zone breccia consists of angular fragments of chert set in a pulverized matrix of fine grains of quartz, carbonate and sometimes epidote and sericite--the texture is definitely that of a crush-or fault-breccia and as such forms a very good host for the cinnabar. Samples taken across 1-foot and 18-inch widths of breccia well charged with cinnabar have assayed: Mercury, 1.09 per cent. and 1.43 per cent.

The widths of better mineralized rock more or less correspond with those of the crush-or breccia-zone, and are usually very poorly defined. In general, the widths of good mineralization range from 6 inches to an observed maximum of 4 feet. The only place where a confining wall is evident is underground in the main drift of the North adit. Cinnabar does not occur in the foot-wall of the main fault, although it extends for irregular distances into the hanging-wall.

The concentration of cinnabar is definitely variable along the length of the shear. The main and best area of mineralization being that in the brecciated material extending from the east end of No. 8 trench westerly to the middle of No. 5 trench, a distance of 140 feet; in this distance the exposed width of mineralization ranges from 1 inch to 10 feet. Representative samples taken by the writer and considered to be more or less typical of this zone, assayed from: Mercury, 2.6 to 7.02 per cent. over 10-foot sections (for details see Fig. 1).

Although cinnabar occurs outside the main zone of brecciation, it is only in small quantities. Samples taken by the writer in sections adjacent to but outside the main zone of brecciation, assayed from: Mercury, a trace to a high of 0.75 per cent; they averaged, Mercury, 0.1 per cent.

The deposition of cinnabar in the westerly group of trenches is not only related to brecciated rock, but also to the occurrence of a heavy bed of more or less crushed quartzite where the best grade of ore in this group of workings has been found to date (June 10, 1939), in No. 12 trench (see Fig. 1). Two samples taken across 12-inch widths of this bed assayed: Mercury, 0.56 per cent. and 2.96 per cent.

At other places, such as in Nos. 11 and 15 trenches (see Fig. 1), cinnabar is disseminated through the ribbons of laminated quartzite.

Minute amounts of stibnite were seen in a small "outcrop" of high-grade near the discovery-post; it is not a characteristic mineral of the deposit.

In addition to cinnabar a small amount of uncrushed, hydrothermal quartz occurs, close to, but not in the fracture-zone. Narrow irregular lenses and stringers of watery quartz up to 3 inches thick occur in the vicinity of a point which is 450 feet south and 540 feet east of the North adit (see Fig. 1), and at a point on the west wall, 100 feet from the portal of the North adit.

Calcite stringers are commonly associated with the cinnabar; these are definitely later than the ankeritization of the limestone, but more or less contemporaneous with the cinnabar.

Favourable conditions for ore-deposition, as opposed to sparse occurrences of ore, appear to have been in part,

(1) The presence of highly comminuted, crushed and brecciated material related to the fracture-zone.

(2) The occasional presence of crushed quartzite, as in No. 12 trench.

(3) Possibly the occurrence of schistose and, therefore, relatively impervious phases of the sediments that seem to have acted as local barriers to rising solutions and aided in the concentration of cinnabar into ore-shoots.



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The type of ground represented by (1) and (2) is relatively porous and would offer no resistance to the passage of mineralizing solutions. No rock-types or structure, other than possibly some schistose phases, definitely suitable to serve as a trap for the concentration of the ore-solutions, and, therefore, suitable for the formation of ore-shoots, were evident at the time of the writer's examination. It is possible that the relatively flat-lying Tertiary lavas, remnants of which occur north and south of Stuart Lake, served as the ultimate trap for the rising mineralizing solutions; the nearest lava remnant is the eastward-sloping cuesta that form Hunitlin Mountain, approximately 11 miles in an air-line north-easterly.

## Kamloops Lake and Vicinity Occurrences

Cinnabar occurs at several places within a belt approximately 8 miles wide that extends for 11 miles northerly and for approximately the same distance southerly from the west end of Kamloops Lake (Fig. 2). The deposits consist of shear-zones and dolomite veins that contain varying amounts of cinnabar. The rocks are greenstone of the Nicola group, which, in the vicinity of the deposits, have usually been intensely altered by ankeritization. The occurrences include the following deposits: Copper Creek Cinnabar Claims; Hardie Mountain Cinnabar Deposit; Sabiston Flats; Davis Showings; Criss Creek Showings (Mercury Mining Syndicate); Charbonneau Showings near Savona Station on the Canadian Pacific Railway; showings in the vicinity of Tunkwa Lake (Fig. 2). These are described in detail in the following text.

COPPER CREEK CINNABAR CLAIMS. The most recent information concerning the cinnabar claims near the mouth of Copper Creek indicates that they were last owned by the Cinnabar Mining Company of B. C., formerly care of Davis, Marshall, MacNeil and Pugh, 626 Pender Street, Vancouver. These claims went into tax-sale in 1938, the date of redemption expiring November 7, 1939.

The property is situated on the slope of the hillside immediately to the north from Copper Creek Station, a flag-stop on the Canadian National Railway on the north shore of Kamloops Lake, approximately 5 miles easterly from the west end of the lake.

There are two means of access, one by Canadian National Railway from Savona, and one by auto-road from Kamloops. The distance is 32 miles by road from Kamloops past Tranquille, up the Tranquille River and down Carabine (Copper) Creek to

Can Mineral Industry
Monthly Rept (AUGUST 75)
E.M.R.



## Lead

After seven months of news concerning falling prices, soft markets and production cutbacks, there were favourable developments during August. Prices continued their upward trend on the London Metal Exchange, and United States' producers increased their price by 1 cent to 20 cents a pound. Battery and chemical manufacturing sectors gathered momentum in August resulting in an increased demand for lead in North America, Europe and Japan. For an analysis of these recent developments see the special item entitled *Lead - An Analysis of Recent Developments* commencing on page 19 of this report.

## Mercury

According to recent press reports, Cominco Ltd. announced that it has suspended operations indefinitely at its mercury property at Pinchi Lake, some 30 miles north of Fort St. James, British Columbia. Some 60 employees are affected by the closure. The company had announced in June that the property would be shut down during July 1975, when most of the employees would be taking their annual vacation. Rising costs of production, declining mercury prices and a world oversupply of the metal were among the major reasons for the decision to close down the mine. The Pinchi Lake mine has been the sole source of Canada's mine output of mercury since it was reopened in 1968.

Another factor that could have had a bearing on the decision to close the mine was the bringing into production in June 1975 of the new McDermitt mercury mine of Placer Amex Inc. near McDermitt, Nevada. This mine apparently has open-pit ore reserves of some 3.5 million tons grading about 0.5 per cent mercury and eventually expects to produce refined mercury at a rate of 20,000 flasks (76 lb each) a year.

The Pinchi Lake mine was first brought into production by Cominco Ltd. in June 1940 because of the need for mercury by the Allied Nations in the Second World War. It operated continuously until July 1944 when operations were suspended because of a sharp decline in the demand for and price of mercury. During the Second World War the mine produced 53,000 flasks of mercury from ore grading an average of 0.29 per cent mercury. The mine was reactivated by Cominco Ltd. in 1968 and shortly after became a substantial producer of mercury. Total capital expenditures for redeveloping and reopening the mine and surface property totalled about $10 million. This $10 million capital investment was returned to Cominco by the end of the first two years of operation. The property was equipped with an 1,100-ton-a-day concentrator and roasting facilities to enable it to produce refined mercury metal. From August 1968, when production was

recommenced, through to the end of 1974, a total of 110,760 flasks of mercury were produced with the greatest annual output being 24,400 flasks in 1970. Ore reserves at December 31, 1974 were 1,300,000 tons containing 110,000 flasks of mercury, or equivalent to a grade of 0.32 per cent mercury.

Although the United States has for many years been the world's largest consumer of mercury it has always produced less than its requirements. A substantial portion of the deficit has continued to come from imports, with the remainder coming mainly from secondary sources and stocks (both commercial and, in more recent years, government stocks). U.S. mercury consumption in 1970 was 61,500 flasks and, after declining considerably in 1971, it gradually rose again to about 60,000 flasks in 1974. On the other hand, U.S. mine production of mercury declined drastically from some 27,300 flasks in 1970 to about 2,200 flasks in 1974. This declining trend was, however, abruptly halted in 1975 with the coming on stream of the new McDermitt mine in Nevada. Statistics Canada has not published data on Canadian exports of mercury metal for over 10 years. However, United States import statistics indicate that a substantial portion of Pinchi Lake's output was shipped to the U.S. market. The Canadian market for mercury has been relatively small, ranging in the past ten years from a low of 1,500 to a high of 5,500 flasks a year.

## Nickel

The employees of Falconbridge Nickel Mines Limited at its Sudbury mines, mills and smelter voted to reject the company's contract offer and went on strike August 21. The offer, which had been recommended for acceptance by the Union's negotiating committee, was similar to the one the United Steelworkers of America at The International Nickel Company of Canada, Limited (Inco) had accepted a month previously. Union members were reported to be unhappy with a company proposal for a change in shift schedules in the smelter.

The International Nickel Company of Canada, Limited (Inco) raised its prices for nickel products at the end of the month. Refined nickel was raised to $2.20 (U.S.) a pound from $2.01 and nickel oxide sinter to $2.07 from $1.88 a pound of nickel content. A nickel price increase had been anticipated since the July labour settlement with 15,000 workers at Inco's Sudbury and Port Colborne operations. Inco last increased its nickel price on December 20, 1974. Other producers are studying Inco's move. The industry is in an oversupply position with both producer and consumer inventories well above normal.

PINCHI LAKE 1973

The Hon. Leo T. Nimsick
Minister of Mines and
Petroleum Resources
Parliament Buildings
Victoria, B.C.

March 21, 1974

Section 71 of the Mineral Act

Dear Sir:

This letter has reference to Section 71 of the Mineral Act and to the letter of Mr. E.W. Craft, Superintendent of our Pinchi Lake Operations, to Mr. J.E. McKynn, Deputy Minister, Department of Mines and Petroleum Resources.

Mr. Craft referred to the property by group names of claims but he did not actually list the names and lot numbers of the Crown-granted claims. A list of these claims is attached hereto in case this will be helpful.

Also, with regard to paragraph C of Mr. Craft's letter where he refers to the rate of production of 178,800 tons per year, I should add that the grade is approximately 5.40 pounds of mercury per ton of which some 90% is recoverable in the plant processes. Normal recovery would be about 12,000 flasks of mercury of 76 pounds each, per year.

Please advise if there is further information required.

Yours very truly,

F.H.P. Dewdney

FHPD:lf
Encl.
cc: RPD
EHC
[illegible]
[illegible]

COMINCO LTD.

## Pinchi Lake Operations Crown-granted Mineral Claims

| Lot Number | Name of Claim |
|---|---|
| 5222 | Chief No. 1 |
| 5223 | Chief No. 2 |
| 5214 | Dugout No. 1 |
| 5215 | Dugout No. 2 |
| 5216 | Dugout No. 3 |
| 5217 | Dugout No. 4 |
| 5218 | Dugout No. 5 |
| 5219 | Dugout No. 6 |
| 5220 | Dugout No. 7 |
| 5221 | Dugout No. 8 |
| 7463 | Island |
| 7462 | Lakefront |
| 5211 | Mercury No. 1 |
| 5212 | Mercury No. 2 |
| 5213 | Mercury No. 3 |
| 5224 | Pinchi No. 1 |
| 5225 | Pinchi No. 2 |
| 5227 | Pinchi No. 3 |
| 5228 | Pinchi No. 5 |
| 5229 | Pinchi No. 6 |
| 5230 | Pinchi No. 7 |
| 5231 | Pinchi No. 8 |
| 5232 | Pinchi No. 9 |
| 7464 | Roaster Fraction |
| 5733 | Victory Fraction |

# COMINCO LTD.

## PINCHI LAKE OPERATIONS

## PRODUCTION INFORMATION

A. The Pinchi Lake Property consists of 23 Mineral Claims and two Fractions, which are Crown Granted and 139 Mineral Claims held by location, as follows:

| | | |
|---|---|---|
| Mercury Group of Crown Grants | - | 23 Claims and two Fractions |
| Wolf Group of Located Claims | - | 12 - 36 (25 Claims) |
| Sam Group of Located Claims | - | 12 - 25 (14 Claims) ✓ |
| Ban Group of Located Claims | - | 1 - 8 ( 8 Claims) ✓ |
| Wit Group of Located Claims | - | 1 - 4 ( 4 Claims) ✓ |
| Nab Group of Located Claims | - | 7,9,11,13 & 15 - 27 (17 Claims) ✓ |
| Cin Group of Located Claims (Held under option from Highland Mercury) | - | 71 Claims in all as listed: |
| | - | 1 & 5 - 28 Inclusive |
| | - | 32 - 34 Inclusive |
| | - | 38,40,42,44,46,48, |
| | - | 50 - 74 Inclusive |
| | - | 76,83,85, |
| | - | 87 - 92 Inclusive |
| | - | 94,98,99. |

B. Production at the Pinchi Lake Mine is obtained from two ore-bodies, the Main Zone and West Zone Orebodies, both of which lie in Cache Creek Rocks about 1000 feet South of the Pinchi Fault, a major structural feature of the area.

The Main Zone is in Limestone, which is in part Dolomitized. The Limestone has Quartz Sericite Schist on Hanging Wall and Footwall and dips at 65 degrees to the North East. Thickness is up to 130 feet. Mineralization consists of Cinnabar in Erratic Stringers filling Fractures and Cavities in the Limestone and Dolomite.

The West Zone Orebody lies about 750 feet Northwest of the Main Zone Orebody; here Silicified Rocks which were originally Chert and Dolomite have been fractured and mineralized by Cinnabar deposited in the fractures. Cinnabar is the only mineral produced.

C. Rate of Production is 178,800 Tons per year.

E.W. Craft, P.Eng.
Superintendent
Pinchi Lake Operations

EWC/ed
February 28, 1974

cc: File

## b) Canex Placer-Endako Mine

The Endako molybdenum deposit is located about 100 miles west of Prince George. It is six miles northwest of the village of Endako, which is on Highway 16 and a branch of the CNR.

The deposit was staked in 1927 by two local hunters. During 1934, a short shaft was sunk on a quartz molybdenum vein that had been uncovered and a short adit was driven into the hillside to intersect another vein. From 1934 to 1959 the property was examined by various companies, but little exploration was done and the claims were allowed to lapse. The key claims were then restaked and following initial trenching and mapping, R and P Metals Corporation Ltd. initiated diamond drilling in 1962.

Canadian Exploration Ltd. (owned by Placer Development) began exploring the property in 1962. Evaluation of their results led to a decision to develop the property for production in 1964. The mill began processing ore at the rate of about 12,000 tons per day in 1965, increasing gradually to about 17,500 in 1967, when a major expansion permitted an increase to 25,000 tons per day. The current milling rate is 27,500 tons per day.

## c) Cominco-Pinchi Lake

The Pinchi Lake mercury mine is located on the north shore of Pinchi Lake, 15 miles northwesterly from Fort St. James, B.C.

The mercury occurrences were first noted by J.G. Gray of the Geological Survey of Canada in 1937. As a result, the showings were staked by A.J. Ostrem in 1937 and the property was optioned by Cominco in the same year.

Development during the next year gave results justifying the establishment of a 50 tons per day roasting unit. Several expansions brought production to 1,000 tons per day by 1942. Due to a failing price of mercury, the production declined after 1943 and the plant was shut down in 1944. The mine resumed production with a completely new plant in 1968 and in 1973 produced 12,500 flasks (950,000 pounds) of mercury.

## d) Craigmont Mines Ltd.

The Craigmont property is located about 10 miles northwest of Merritt. Access is by paved road connecting with Highway 8 at Lower Nicola, and the Canadian Pacific Railway at Coyle.

Source: Wright Engineers Report, March 1975
Central Region Account of Developments in the Mineral Sector

X