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A Report on the Geochemistry of the PEACH NORTH & SOUTH GROUPS, Clinton Mining Division (1 - 2 miles south of Peach Lake, 51° 121° S.E.)

by

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lst. September 1966 - 8th. August 1967

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SUMMARY

An extensive soil sampling programme over a recent copper discovery in the Lac la Hache area shows a distinct zone anomalous in copper. The zone, broken by a barren section possibly due to deep overburden, extends east---southeast from the discovery area for a total length of 5000 feet and has an average width of about 600 feet.

The mineralization so far exposed and the character of the anonalous zone indicate that further work is warranted. An induced polarization survey is recommended as the next phase of exploration.



INTRODUCTION AND ACKNOWLEDGMENT

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A geochemical soil survey over a recent copper discovery is described. The discovery itself was located as a result of a geochemical reconnaissance programme carried out in 1966.

This report results from the work of the Coranex staff in the field, laboratory and office. Particular acknowledgment is made to J. R. Woodcock for general direction of the programme and whose suggestions and ideas are incorporated in the text.

LOCATION AND ACCESS

The area of mineralization and survey described is located in the rolling uplands of the Cariboo, east of the Fraser River and approximately 12 miles north--northeast of Lac Is Hache, a small community on the Cariboo Highway. Geographical location is latitude 52° 57° - 58° and longitude 121° 19° - 21° .

Surface showings are present between 4000 and 4500 feet a.s.l. on the northern edge of a plateau which overlooks Peach Lake to the north and Spout Lake to the northwest. Vegetation is largely jackpine with minor underbrush.

The main showing is readily accessible from Lac la Hache via an all year gravel road (11% miles) and a good dirt access road (7 miles), virtually an easy day's drive from Vancouver (360 miles).

The dirt access road includes 14 miles of private road owned by Weldwood of Canada. The remaining section was put in during November by Petersen of Williams Lake on contract to Coranex Limited. Prior to road building, 12 claims, the Access Group, were staked to protect the "right-of-way". The access road was later extended four miles west during July 1967.



HISTORY AND WORK DONE

Silts, anomalous in copper, from creeks between Spout and Bluff Lakes first drew attention to the area. Prospecting revealed very small amounts of chalcopyrite and bornite irregularly disseminated throughout a symite. The Rover Claim Series (1 - 79) secure this ground. Detailed silt and soil sampling of this group failed to disclose mineralization with economic potential.

Close reconnaissance silt sampling was extended to the south and east across the sympite - Nicola Volcanics contact. During August, samples from several small creeks draining the area south of Peach Lake gave anomalous results of a low order. A "follow-up traverse" indicated the area to be anomalous in copper. On this evidence and due to the presence of several competitors in the locality, a block of seventy claims (Peach Series) were staked. A staking crew, while cutting a claim location line, discovered mineralized float on what is now the Peach #1 Showing.

Examination of G.S.C. Map 3-1966 (Bonaparte River) indicated that similar geology and therefore "attractive ground" existed to the immediate south. Consequently a block of 144 claims (Fly Series) was secured. Silt samples taken from drainages crossed on the location lines suggested that the northern section of this block was anomalous in copper.

Close sampling of the drainage systems to the east of the claim blocks indicated a further area anomalous in copper and molybdenum. This area was also staked (Tim Series).

After additional drainage sampling and geologic mapping the secured ground was further extended.

During the period August 2nd. to October 23rd., 481 claims were staked (Peach 1 - 210; Fly 1 - 161; and Tim 1 - 110).

A combined programme of prospecting, geologic mapping and detailed drainage sampling was carried out on and about the claim blocks from September 22nd. to October 4th. by J. R. Woodcock, C. C. Campbell, N. Wychopen and R. H. Janes. During this time a hand-dug trench (35' x 2' x 4') was put down at the "discovery location" and a preliminary soil sample grid was completed in the vicinity of the main showing (Peach #1).

The anomalous drainage on the Tim Group was sampled by N. Wychopen on widely spaced grid lines later in October.

During October and November a good access road was constructed to the Peach #1 Showing, a campsite prepared and tent frames moved in from the summer base camp on Horsefly Lake.

Three bulldozer trenches taken to "hard bed-rock" and totalling 2100 feet in length, were cut across the Peach #1 Showing during the period November 18th. to November 28th. Five hundred feet of these trenches were sampled by R. H. Janes.

The results of the work in 1966 were encouraging enough to warrant detailed geochemical and magnetometer surveys over an area of several square miles which included the Peach #1 Showing. These were carried out during the period May - August 1967 from a base camp established on the Peach claim group.

1. General

Geological mapping of the area is sketchy. C. J. Campbell, R. H. Janes and J. R. Woodcock spent ten days at the end of September mapping the Nicola Volcanics south of Peach and Spout Lakes. This was done using air photographs of scale 1" = 1/4 mile. Traverses were planned to provide background information for planning the 1967 programme.

The area considered extends from Murphy Lake southward to Timothy Lake and from Spout Lake — Timothy Lake eastward to Bradley Creek, an area of approximately 115 square miles. The main topographical features are (i) a series of east-northeast-west-southwest and east-west trending lake and drainage systems and (ii) two deep parallel valleys which trend north-northwest. These latter valleys, Timothy and Bradley border the area. Between them lies the Mt. Timothy massif**.

The major portion of the massif is composed of Nicola Volcanics which lie within an embayment in the southwest corner of a major batholith. A granodiorite phase forms the east flank of the massif. A sygnitic phase protrudes from the batholith and underlies the area north of Peach Lake and may extend north to Murphy Lake and Eagle Creek. Two varieties are present, each distinct in colour and location. Pink symite occurs north of Peach and Bluff Lakes and grey symplet to the south and east of Spout Lake. Bluff Lake. situated within the pink syenite, has a noticeable deposit of iron hydroxides along its shore. In the northwest the syenite is overlain by Eocene Volcanics. The contact between syenite and Nicola Volcanics is overlain by recent sediments. The Nicola Volcanics and the granodiorite are separated by a zone of contact metamorphism along which hornfels has developed. Nicola Volcanics underlie the Peach and Fly Groups. These are largely coarse fragmentals but some fine grained tuffs crop out on the Fly Group. Small isolated occurrences of meta-diorite, surrounded by zones of dioritization. occur in the Nicola Volcanics within the esbayment. The Peach Group of claims covers most of the meta-diorite occurrences.

A dark massive pyroxene-rich rock, termed a pyroxene basalt, crops out in an east-west trending ridge south of Spout Lake. It also forms narrow dyke-like bodies within the Nicola Volcanics.

2. <u>Structure</u>

Only the gross structures are recognized due to the lack of banding and marker horisons.

The topography is assumed to reflect zones of movement. The bounding north-northwest trending valleys of Timothy and Bradley Creeks represent the major faults of the area. Between these valleys the drainage pattern shows a preferred direction of east---northeast (65°) and may reflect the development of a tension fracture system.



The contacts between the syenite and the Nicola Volcanics and between the two varieties of syenite may also follow this direction.

COPPER MINERALIZATION

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1. Introduction

Minor copper mineralization is scattered over an area of approximately 12 square siles. Though prospecting and mapping disclosed many minor occurrences only one. Peach \$1 Showing, is considered to be important at present. This is described indetail in the following section.

Two types of mineralization are evident according to alteration and host. The most important is where chalcopyrite occurs in and adjacent to meta-diorite and is associated with areas of orange alteration. The second type, much less significant, is where minor chalcopyrite and bornite occur in green skarn zones. The Peach #1 Showing is of the first type. The Tim #1 Occurrence is of the skarn type. Several float occurrences of fresh andesite carrying chalcopyrite or copper staining in fractures have been noted. Minor mineralization is present in the pink syenite.

Peach #1 Showing - Figure

The showing is situated on the north flank of the Mt. Timothy massif at the edge of the summit plateau, elevation 4400 feet above sea level. Chalcopyrite was first seen in locally derived float. Outcrop is fairly common and intermittent mineralization can be found over an area 800 feet by 200 feet. Outcrop is absent to the east.

Dioritized volcanics underlie the area, the extreme phases of meta-diorite crop out approximately 1000 feet to the west and to the south of the initial discovery area (the hand-dug trench).

Chalcopyrite occurs as fracture fillings and as associated local disseminations. Such fractures generally show orange coloured areas of alteration which on occasion carry tourmaline. The amount of chalcopyrite present tends to correspond with the degree of orange alteration. Three parallel zones of fracturing were exposed in the trenching, the approximate strike is 55°. Overall attitudes cannot be determined yet.

Associated minerals are few. Plates of secondary biotite up to 1/2" in diameter are present locally (Tr's. 1 & 2). Chalcedony and crystalline chalcopyrite are present in some vugs. Pyrite is rare at surface. However a trench blasted into trench #1 exposed mixed pyrite and chalcopyrite.

Weathering has produced appreciable iron oxides along the fracture zones. This weathering extends below the level of the trenches as it follows the individual fractures and joints. Malachite and azurite occur in the wetter areas. The general lack of pyrite suggests that it is the chalcopyrite in the fractures that has broken down. However, carbonate is present up to 20% in some rock specimens and, if ankeritic would provide some iron oxides on weathering.

Of the occurrences located to date only this showing was considered to merit further detailed work. Sampling of the bulldozer trenches was curtailed by snow. Trench #1 was not completed and trenches #2 and #3 were sampled at the best looking locations.

Trench #1 affords the best intersections:-

0.33% Cu. & 0.02 oz. Au. over 40 feet and 0.37% Cu. & 0.02 oz. Au. over 10 feet Zones are 90 feet apart (intervening area not all sampled)

Trench #3

0.51% Cu. & O.04 oz. Au. over 10 feet and 0.93% Cu. & O.01 oz. Au. over 10 feet Zones are 50 feet apart (intervening area not all sampled)

The best section in the hand-dug trench next to trench #1 gave 0.46% Cu. & 0.01 oz. Au. over 10 feet

Check analyses for tin and uranium:-

Sample	Au. (oz.)	Cu. (%)	Tin (%)	U308 (%)
	والوكر المراقبة البلاك فالكراب البرز فيود معاد بمعتدهم	······		
6786	0.06	0.39	Tr.	0.01
92893	0.02	0.41	Tr.	0.005

All the fractures along the sample lines were weathered and contained limonite and allied oxides. Most of these iron oxides are considered to have originated from chalcopyrite breakdown. The amount of depletion of copper values at surface due to weathering processes (chemical and mechanical) is unknown, but may be significant.

GENCHEMISTRY - Method

1. Field Procedure

The preliminary soil survey, conducted during September 1966, covered the immediate area about the Peach #1 Showing. A central north---south picket line, two parallel blazed lines and three east--west blazed lines provided ground control. A total of 129 samples from the "B" horison were taken at 100-foot intervals along the lines.

The preliminary survey was incorporated into an extensive survey carried out in the following summer. A grid system with

north-south lines at 800-foot intervals was laid out to cover an area 12,000 feet in an east-west direction and 7000 feet in a northsouth direction. A central north-south picket line and bordering east-west picket lines provided the necessary control. The remaining lines were blazed north-south using a compase bearing. All lines were picketed or marked at 200-foot intervals (horizontal distance). Particular areas of interest within the grid were covered in greater detail.

Where possible the "C" horizon was sampled. Field information regarding the sample and site was recorded, at the time of sampling, on standard data forms.

Samples were dried at the base camp prior to despatching to the Company's laboratory. A set of field standards, derived from the area, was made up and were incorporated within each sample shipment. These provided a constant check on laboratory results. The values of the field samples were also corroborated by outside analyses.

2. Laboratory Procedure

Samples from the preliminary survey were treated differently from those of the main survey and consequently are considered separately.

a) Preliminary Survey

Each sample was analyzed for total and soluble copper, molybdenum and mercury. The methods used are as follows:-

Total Copper:- Biquinoline and colorimetric determination. Soluble Copper: - Holman method. Total Molybdenum:- Ammonium thiocyanate and colorimetric determination.

Mercury:- Determined using the Lemaire instrument.

A one-quarter gram of sample, digested in hot perchloric acid, was used for the total metal determinations.

b) Main Survey

Each sample was analyzed for total and soluble copper and its pH value was determined. The methods used are as follows:-

Total Copper: - 1 gm. of sample, hot perchloric acid digestion and determination by atomic absorption spectrometer. Soluble Copper:- Nolman method.

pH - Determination carried out on mixture of sample and distilled water using a pH meter.

3. Presentation of data

Sample values were colour graded using scales with arbitrarily selected "background ranges". These ranges formed the basis for arithmetic progressions. Geologic, topographic (drainage) and geo-

chemical conditions are considered before an area is judged anomalous.

GEOCHEMISTRY - Factors Affecting

1. Local or Natural Factors

Throughout the area of the survey the soil has formed from a cover of thin (generally <25 ft. thick) clay-rich (?) till. Fragments from the underlying bed rock are frequently dispersed throughout this till and indicate that much or most of it, particularly in lightly covered areas, is locally derived. The soil would be termed a podsol on account of its climate, drainage and vegetation. Generally it is poorly developed and has little profile. A noticeable contrast exists in the water content of soils situated on north and south slopes.

Soil profiles, from three separate mineralized areas, are shown in figure . In the two shallow areas (depth <36 inches) the soil horizons clearly exhibit different total copper contents. In each case the value for the "C" horizon is hetween one and a half to twice that of the "B" horizon. The values for the "A" horizon are irregular and generally lower than both those for the "B" and "C" horizons. In the areas of thicker till (> 7 ft.) the values of the horizons are less distinctive though the till immediately above (mineralized) bed rock at this site would no doubt show a significantly higher value. From the foregoing it is evident that a thick covering of till can be expected to mask mineralized bed rock.

A further condition is evident from the shallow profiles. In each case the total copper content of the "C" horizon (-80 mesh portion) is appreciably higher than that of the immediate bed rock. This condition may also exist at the location 36E, 63S where bed rock at the base of a hand-dug trench (3 ft. deep) assays up to a maximum of 0.4% copper and a soil sample from the "C" horizon in the wall of trench carried 0.6% copper. This limited evidence suggests an upward transportation from the bed rock fractures and concentration in the "C" horizon by clay (?) particles. Such transportation of copper may be affected by the upward movement of ground water during dry summers. In these instances the soluble copper content is about 1% of the total content, however these values were not determined precisely.

Variations in soil and ground water acidity and oxidation potential are additional factors. Information is provided on the first two factors.

2. Artificial or Foreign Factors

In the field the factor most likely to produce variations from the true picture was the occasional unintentional sampling of



Peach #1 Showing, Trench #1, co-ordinates 1+20W & 51+00S



Peach #1 Showing, Hand-Dug Trench, co-ordinates 0+35W 50 + 60S



Peach #1 Showing. Trench #3, co-ordinates (left profile 2+25E & 51+50S (right profile 2+25E & 48+00S

SOIL PROFILES, PEACH LAKE PROJECT

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an "A" or "B" horizon.

In the laboratory procedure the comparatively large sample (1 gram) analyzed for total copper and molybdenum assured that it was representative of the whole. A set of laboratory standards were also incorporated within each series of samples.

The results obtained using the Lemaire Mercury Detector are very subject to error. Values are not readily reproducible. A recent article by M. Koksoy et al* states that duration of heating, temperature attained, grain size and ease of contamination are critical factors in mercury determination. With this in mind the mercury results are regarded as being very approximate.

GEOCHEMISTRY - Results

1. Preliminary Survey

An irregular east-west trending zone, anomalous in copper, is evident. This and exposed mineralization guided the location of the trenches.

Assays from the trenches show that the highest copper values occur at the south end of trench #1 in a zone which appears to continue through to the southern half of trench #3. This zone is included within the total copper anomalous area but borders the Holman copper anomalous area. The northern part of the total copper anomalous zone is, surprisingly, not reflected by the Holman copper. Both total and Holman copper results indicate that the mineralization extends to the east and, less so, to the west. The total copper results suggest an extension north of trench #3.

The mercury results do not correlate well with those for copper and consequently are considered to have little application at present.

2. Main Survey

A zone of anomalous copper values extends for 8800 feet in an east---southeast direction across the grid area. The zone is discontinuous and of an irregular width which varies to a maximum of 2000 feet.

Two other much smaller somes border it on the south. The copper background of the soil overlying Mesozoic Volcanics is in the range 30 to 70 ppm. Values above 159 ppm were graded as anomalous.

Apart from the Feach #1 Showing surface examination of the anomalous areas has generally disclosed only very minor amounts of chalcopyrite, both disseminated and along fractures. At one location, 638 on L36E, malachite stained float occurred over an area of about

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^{*}Notes on the determination of mercury in geological samples. M. Koksoy, P.M.D. Bradshaw and V. S. Tooms, Trans. I.M.M.(Sect.B), 76, May 1967.







twenty square feet. Chip samples from a hand-dug trench gave 0.27% Cu over 15 feet. The copper occurs as chalcopyrite along fractures.

OEOCHEMISTRY - Interpretation

The anomalous areas mirror an extensive zone of very weak chalcopyrite mineralization. The scale selected for grading the values is not appropriate and a scale with a range of 400 to 800 ppm for the anomalous condition would be more realistic.

The boundaries of several of the anomalous areas are concurrent with the edge of deep overburden. Consequently the boundaries of the anomalous areas do not necessarily mark the end of mineralization.

Drainage and pH data indicate that no correlation exists between poorly drained areas and the anomalous sones. The areas of poor drainage are characterized by an appreciably higher pH than the well drained areas. This value generally remains in the acid spectrum (6.1 to 7.0) and presumably does not facilitate the concentrating of copper which frequently occurs in other swampy areas.

CONCLUSIONS and RECOMMENDATIONS

Those areas within the zone, anomalous in total copper, which show soil values greater than 400 ppm are considered to indicate significant mineralization in bed rock.

Two such areas are present. One includes the Peach #1 Showing. The other lies to the east---southeast of the Peach showing and extends in that direction for approximately 3000 feet. These areas may express a continuous mineralized zone as the barren interval has considerable overburden.

The copper mineralisation (Peach #1 Showing) discovered to date and the anomalous (> 400 ppm) areas located by the soil survey merit further work. The object of such work would be to determine whether or not economic concentrations of chalcopyrite exist within the outlined mineralized sone. Induced polarisation techniques are well suited to this purpose and are recommended as the next phase of exploration.

and P. Eng

August 7, 1967

APPENDIX I

Personnel

J.	R. Woodcock	-	Manager
R.	H. Janes	-	Geologist
c.	J. Campbell	-	Geologist
c.	Chun	-	Chief Chemist
N.	wychopen	-	Prospector
D.	Matthews	-	Field Office Manager & Draftsman
R.	Dickinson	-	Sampler
м.	Foster	-	Sampler
Α.	MacLeod	-	Sampler
L.	Dawson	-	Sampler
٥.	Paget	-	Sampler
L.	Тувое	-	Sampler
в.	Walhovd	-	Sampler



	LEGEND			
(Said)	Quatenary Volcanics.			
	Miocene Volcanics.			
	Eccene Volcanics			
	Meto - diorite.			
+100\$	Meta-diarite, limited outgrop.			
	Coarse-grained Syenite.			
	Granadiquite.			
(5)	Hornfels.			
	Pyroxene Basait. R.H. Henry for August			
	Triassic Nicola Volcanics.			
\bigcirc	Boundary of area showing orange alteration and			
	Lime silicate alteration.			
	Copper Occurrence.			
F##	Geochemical Sail Grid.			
	CORANEX LIMITED			
	PEACH LAKE AREA			
Caribao & Clinton M.D's., B.C. 93A-3 & 92P-14				
PRELIMINARY SUB-SURFACE GEOLOGY				
Topographic base map from B.C. Provisional Maps Sci Utru/2 mi				
Scale: 11" = 11/2	mile March 1967 danes			

1038 Fig. 4.

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MPAS CARIBOO NP38 LAND DISTRICT

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MP33

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MP34

Bedi



MP38







Department of Mines and Petroleum Resources ASSESSMENT REPORT NO. 10.38 MAP # 10	72 W	8. 2 2	56 W	4 B V	4 ¥
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Perch 15 14	9 9 9	P Fly	· · · ·	9 9 9 9 9 9 9 9 9 9 9 9	3 9 9
	9 9	9 119 120	2	?	9
	9 9 9	9 5 9 Fig 121 122	0 7 9	2 7 9 00	9
		FP D LP			

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LEGEND				
0-	2	Background		
3 -	4	Questionably Anomalous.		
5 -	8	Slightly Anomalous.		
9 -	16	Anomalous		
17 -	32	Highly Anomalous		
>3	12	Outstanding.		

