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TO: W. M. SIROLA  
FROM: FRED CHOW  
SUBJECT: Tatlayoko Lake Project -  
Period June 5th to July 7th, 1968.

Dear Bill:

I got "snowed under" and did not send you progress reports sooner and more often. I shall report regularly from now on.

During the first week, between June 5 - 12th the student geological parties surveyed the area surrounding the upper section of Tatlayoko Lake, and worked out from base camp. Later they were placed in fly camps within the area bounded by the Yalakom and Tchaikazan Faults, and within the area of sedimentary cover. This area is mainly covered by Jurassic and Cretaceous sediments and is intruded by several granitic plugs of varying sizes.

The low snow level and late run-offs greatly dictated the placing of field crews at the start of the season. One advantage is that the field crews were within the area of the airborne magnetic survey and therefore able to check out any anomaly immediate to their camp.

The one prospecting crew was placed in the Miner Lake to Calwell Creek valley partly because of snow conditions and partly because the Mosley Creek valley was open for grizzly bear hunting. (Forestry advised to take extreme caution - bait had been scattered by hunting guides). After ten days, the crew was moved to Mosley Creek, a more

favourable area in Triassic formations cut by numerous structural features.

An airborne magnetic survey was conducted over the area bounded by the Yalakom and Tchiakazan Faults, and within the area mapped as Jurassic and Cretaceous sediments by Mr. H. Tipper, GSC, in 1967.

In the past weeks work, no mineralization of interest was found and no significant geochemical results were obtained.

The airborne magnetic survey was successful in locating targets, and without the interference or masking effects caused by other rocks in the area surveyed. Four flight lines were flown over the area in the NE corner of the map sheet (92-N), to test the Jurassic and Tertiary volcanics plus the Mesozoic metamorphic rocks. Jurassic volcanics may be distinguished from Mesozoic rocks by the slightly higher magnetic trace on the tapes. Both show an even trace except for the Jurassic volcanics along the Yalakom Fault near Choelquoit Lake. The Tertiary volcanics is expressed by the clutter of magnetic highs.

Within the Jurassic and Cretaceous sediments, the magnetic anomalies are not numerous and the obvious ones are intrusives which have been previously mapped. Most of these have been examined and found wanting or barren of mineralization of value. A few others have been checked by the field crews and in most cases the cause of the magnetic highs have been magnetite in intrusives. Basalt is the other rock found which contain magnetite.

The magnetic intrusives located or checked out so far are mostly quartz-diorite, with one quartz monzonite. Of the non-magnetic intrusives, one quartz-feldspar porphyry and a biotite-feldspar porphyry was found associated with the quartz monzonite. All the intrusives examined contain no sulphide mineralization.

On June 26th the total field crew was decreased from five to four <sup>crews</sup> when G. McFadyen, leader of Party #3, quit because he did not like bush work any more.

Following is a detailed account of the work done in each area to date:

Area 1, 2, 3 & 4: ( $51^{\circ}31'45''$  Lat./  $124^{\circ}15'30''$  Long.) 92N/9 W $\frac{1}{2}$

The area surrounds the upper section of Tatlayoko Lake and was traversed by the four student parties. The work was carried out from base camp using the helicopter and the Land Rover for ferrying the crews to and from the work areas.

Geology:

Most of the area is overlain by sedimentary rock, consisting of conglomerates, greywacke, argillite, quartzite and limestone. The former include rocks of sedimentary and volcanic origin.

A large quartz diorite mass occupies the NW corner Tatlayoko Lake and a smaller one lies between Mt. Skinner and the lake. These two are shown on Mr. H. W. Tipper's Summary in the GSC 1967 Report of Activities. A small outcrop of quartz diorite was found  $1\frac{1}{2}$  miles SE of base camp.

Biotite is the main mafic mineral in all the three intrusives. The latter mentioned intrusive show considerable feldspar alteration, the second one show moderate alteration, and the first one show no alteration except near the immediate contact.

Mineralization:

No mineralization was found in the sedimentary rocks and pyrite is scarce in all the rock types. A few specks of chalcopyrite, pyrite and minor magnetite was noted in the rock along the contact of the intrusive NW of Tatlayoko Lake. No rock specimens were brought in from the large gossan zone west of the lake.

Geochemical Results:

The regional back-ground is between nil to 20 ppm copper and a trace in Mo, Pb and Zn.

Two areas show above background in Cu values: the west slope of the Potatoe Range between 51°33' - 35' Lat. gave up to 40 ppm Cu and the contact of the large intrusive showed values of 40 - 150 ppm Cu. In the first area, minor fine-grained pyrite was observed in the greywacke but no sulphides were found in the other rocks - sandstone and calcareous limestone.

The large gossan west of Tatlayoko Lake caused no significant high copper values in the drainage at the toe of the snow field. The highest Cu values were obtained at this higher elevation. Values range between 90 - 150 ppm Cu; Trace to 4 ppm Mo, and Trace in Pb and Zn. Victor Dolmage, in his 1924 Summary Report, says only traces of gold was found in a sample taken from this red mountain, but no mention was made of copper mineralization.

This gossan zone deserves a days prospecting when more snow is gone, even though it is conspicuous and the geochemical values are not extremely high.

Area 5: (51°45' - 52°00' Lat./ 125°00' - 15' Long.) 92N/14 E½

Wilf Christian and Cap <sup>Party #1</sup> Cornwell spent nine days prospecting the granite - Cretaceous sediment contact northwest of Perkins Peak. Nothing of interest was found. The high areas are still snow covered and were not prospected.

Geology:

The Coast Range intrusive along the contact is biotite rich granodiorite, and the adjoining sediments are argillite, sandstone, quartzite, and minor limestone. Andesite occurs at the south end of the long lake due west of Perkins Peak.

Mineralization:

Disseminated pyrrhotite occurs in the sandstone and disseminated pyrite occurs in the quartzite. Thin bands of magnetite were found in rock float west of Perkins Peak.

Geochemical Results:

Silt and soil samples show a background of 20 - 30 ppm Cu over the granodiorite and 10 - 20 ppm Cu over the sediments. Readings of 35 - 45 ppm Cu were obtained from the samples collected in the valley below the gossan zone south of Perkins Peak.

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Area 6: (51°30' - 45' Lat./ 124°00' - 15' Long.) 92N/9 E½

Party #2 (Joe DeCarli and Richard Scott) traversed the area west of Chilko Lake (NW) and northerly to the Chilko River inlet. Nothing of interest was located.

Geology and Mineralization:

Sediments similar to the east side of Tatlayoko Lake occur in the area traversed. No mineralization was seen and no intrusives were found.

Geochemical Results:

The area gave a nearly uniform reading of 20 ppm Cu.

Area 7: (51°45' - 52°00' Lat./ 124°30' - 45' Long.) 92N/15 E½

Party #3 (Garfield McFadyen and Mike Lopatecki) traversed most of the area south of the Yalakom Fault. It is doubtful whether the party leader made any effort to do a proper job. Nothing of interest was reported.

Geology and Mineralization:

The large intrusive in Area #1 extends northwestward into this area and occupy most of the region south of the Yalakom Fault. It is contact with Cretaceous volcanics on the SW and NW.

Few outcrops were seen in the area traversed, where found the intrusive is rich in biotite and is of granodiorite and/or quartz diorite composition. The rocks show minor alteration with chlorite. The volcanics are altered to a greenish color.

Geochemical Results:

The background reading within the intrusive is about 20 ppm Cu and near the contacts it is about 40 ppm Cu

Area 8: (51°15' - 30' Lat./ 124°00' - 15' Long) 92N/8 E½

Party #5 (Robert Thorburn and Matt Waldner) surveyed only the most easterly area which drains into Nemaia Creek and the west shore of Chilko Lake in the NW corner of the map sheet. Nothing of interest was found.

Geology and Mineralization:

The area traversed is overlain by sediments comprising of sandstone, siltstone, and altered sediments. No mineralization of value was encountered.

Geochemical Results:

Silt and soil samples assayed from 10 to 40 ppm Cu and showed no significant values.

Area 9: (51°45' - 52°00' Lat./ 124°45' - 125°00' Long.) 92N/15 W½

Party #4 (Paul Pitman and Bob St. John) have covered the Cretaceous volcanic area between the Yalakom and Tchaikazan Faults, and also the area of Cretaceous sediments south of the latter fault. The area traversed was found barren of mineralization of value.

Geology and Mineralization:

The northern section is composed of mainly green volcanic

rocks, with minor slate and limestone. Immediately north of the Klinaklini River both volcanic and sedimentary rocks occur. The latter consists of conglomerates, slate and limestone.

Cretaceous sediments are chiefly greywacke, with minor sandstone and shale.

No sulphides or other mineralization of value were found.

Geochemical Results:

The results show a uniform low of 10 - 20 ppm Cu.

Area 10 (51°30' - 45' Lat., 124°45' - 125°00' Long.) 92N/10 W½

Party #1 <sup>(Christian & Cornwell)</sup> was moved into this area from Area 5 to prospect

this region of major faults which cut the Triassic formations. The Triassic rocks in the NE corner of the map sheet (along Mosley Creek) was traversed first, then the Cretaceous sediments downstream was covered next because of low level snow conditions in the remaining area of Triassic rocks.

Geology and Mineralization:

The Triassic sedimentary rocks are calcareous argillites, sandstone and minor to massive limestone. The volcanics are tuffs and conglomerates. Oxidation zones spotted from plane are found to be buff weathering of calcareous rocks. A few dykes and sills occur in sediments about 3 miles SW of Bluff Lake. One of these showed minor pyrite.

The Cretaceous sediments are argillite, sandstone and greywacke. Cretaceous volcanics are chiefly olivene rich, green-coloured rocks; also minor red coloured tuffs.



Except for minor occurrences of pyrite and a few specks of chalcopyrite, no other sulphide minerals were seen.

Geochemical Results:

Northwest of Mosley Creek the silts and soils range from 20 - 40 ppm Cu, and the southeast side range from 10 - 20 ppm Cu. A slight rise to 50 - 60 ppm Cu was found in both branches of Razor Creek along the Blackhorn Thrust Fault. No high values were obtained from the samples.

Area 11: (51°30' - 45' Lat./ 124°30' - 45' Long) 92N/10 E½

Party #1 prospected a narrow strip of this area which joins Area 10.

Area 12: (51°45' - 52°00' Lat. / 124°15' - 30' Long) 92N/16 W½

Parties #3 and #5 surveyed the small triangular area, SW of the Yalakom Fault, in the SW corner of the map sheet. Party #3 traversed the area west of Homathko River and Party #5 examined the area immediately south of Cochin Lake to check out an airborne magnetic anomaly.

Geology and Mineralization:

The area is bounded by the Yalakom fault and another SE fault, and lies along the border of the granite-sediment contact. Quartz diorite and conglomerate sediments were observed on the upper elevations of the mountain on the west. No outcrop was found elsewhere in the area. No mineralization of value was located.

Geochemical Results:

Along the granite-sediment contact the silt and soil samples showed 20 ppm Cu, and that within the intrusive showed only 10 ppm Cu. Soils taken over the magnetic anomaly assayed a constant 20 ppm Cu.

Area 13: (51°15' - 30' Lat./ 124°15' - 30' Long.) 92N/8 W½

Party #5 was shifted to this area from Area 8 to investigate the magnetic anomalies located by the airborne survey. This immediate move was prompted by the activities of another exploration company in this area surrounding the Morris Mine.

The work was conducted in the usual manner but with emphasis on finding the cause of the magnetic highs.

Geology and Mineralization:

In the area of interest, intrusive comprising of quartz-feldspar porphyry, biotite-feldspar porphyry and quartz monzonite outcropped along the south-facing clope north of Stikelon Pass. The country rock are sandstone, siltstone and altered sediments.

Both porphyries are non-magnetic. The quartz monzonite contains fine and medium grained magnetite (est. 0.5%). No sulphide mineralization was seen. The biotite-feldspar porphyry and the quartz monzonite is highly altered, and the quartz-feldspar porphyry is fresh looking.

On the north facing slope south of Pass a small outcrop of feldspar porphyry was noted in volcanic country rock (Cretaceous) - mainly breccia. No sulphide mineralization was found. No specimen of this intrusive was sent in for examination.

Geochemical Results:

So far only the samples taken from the eastern boundary area of the map sheet have been tested in the laboratory, and these show normal background of 20 ppm Cu, with negative results in Mo, Pb and Zn.

Airborne Magnetic Anomalies:

As mentioned at the first part of this report, magnetic anomalies are not numerous in the Jurassic and Cretaceous sediments. It appears that Cretaceous volcanics may show the same results, though the survey covered only a small portion of the latter rocks south of Tchaikazan fault.

Area 2:

The survey outlined the quartz diorite intrusive at the Mt. Skinner-Lincoln Pass area clearly except for the northern contacts where suspected basalts and/or andesites tend to mask the results.

Party #4 had earlier traversed part of the ground. Party #5 spent one day on the remaining area of interest. Biotite rich quartz diorite with disseminated magnetite is the only intrusive found and no mineralization of value was noted. Silt and soil samples over the entire area did not show any values over 20 ppm Cu.

Area 6:

Three areas of magnetic highs are indicated: one large one (500 - 1000 gammas) in the volcanics immediately north of Choelquoit Lake, another large one (200 - 500 gammas) straddles the Chilko River just north of the Yalakom Fault, and a much smaller and narrower one (50 - 150 gammas) lying slightly south and nearly paralleling the fault across the Chilko River.

Party #5 investigated the first one and found mainly basalt with one quartz diorite intrusive as shown on Dolmage's 1924 geological map. Both types of rock are highly magnetic. No mineralization of value was seen and low (10 - 20 ppm Cu, Trace Mo) values were returned from the silt and soil samples.

The third magnetic anomaly lies in an area of low relief and as yet no evidence has been found by Party #2 to explain the magnetics. Silt and soil samples that have been tested do not show any values of significance. This anomaly which almost parallels the Yalakom Fault may be caused by a parallel structural break of the major fault.

Area 12:

One long and narrow anomaly was located along the Yalakom Fault immediately SW of Cochin Lake (51°47' Lat/ 124°26½' Long). The greater part of the anomaly is elongated approximately 7 miles NW to SE along the south side of the fault, and the smaller length (SE of main anomaly) is along the north side. The latter appears to be an offset portion. Magnetic value is from +50 gammas to +450 gammas.

The area has low relief and is covered by overburden except in the most westerly end where the large quartz diorite mass is exposed. This is the same intrusion which extends from the NW corner of Area 1.

Party #5 found minor magnetite and chalcopyrite along the contact in the NW corner of Area 1, but Party #3 did not get any evidence of wide spread magnetite mineralization to verify the cause of the magnetic anomaly.

Sufficient silt and soil samples were collected to cover the anomalous area but none show anomalous values in Cu, Mo, Pb or Zn. Samples contain only 10 - 20 ppm Cu.

From a study of the tapes and the known geology of the area, the anomaly is interpreted to be caused by magnetite mineralization within the granitic intrusion along the Yalakom Faults contact. Either Jurassic volcanics or metamorphic Mesozoic rocks occupy the northern side (indicated by the higher level trace on the tape).

No further work is contemplated for this anomaly.

#### Area 13:

The anomalies straddle Stikelan Pass which connects Tatlayoko Lake to Chilko Lake. In main, the greater part lies within the Jurassic and Cretaceous sedimentary area immediately north of the Tchaikazan Fault and east of a NE striking fault. The anomaly which ranges from 100 gammas to 625 gammas is surrounded by low magnetics except for the north boundary which was not completely flown.

Work done in this area is reported on pages 9 and 10 of this report.

#### Future Plans for Project:

- 1) Party #1 will continue working in Area 10, then move to Area 11 and try to traverse as much ground as snow conditions and hillside terrain will permit. After this coverage Party #1 will move into the area SW of Tatlayoko Lake, 92N7 E $\frac{1}{2}$  to prospect the Triassic rocks and granitic contacts.

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- 2) Party #2 will continue and complete Area 6 extending the traverses about 2 miles (north) beyond the Yalakom Fault.
- 3) Party #4 will complete Area 9 in ten days and then move into the area SW of Tatlayoko Lake, 92N/7 W $\frac{1}{2}$  to survey the Triassic and granitic contacts, and silt sample the entire drainage system.
- 4) Party #5 will continue in Area 13 to thoroughly examine the ground and silt sample the streams.
- 5) Chow will check on isolated magnetic anomalies and gossan zones.

The decision to move out of this area for the Pemberton Area could not be finalized until more of the Triassic rocks and all the magnetic anomalies have been checked out.

I should have a better knowledge of this area in about two weeks.

(signed)

Fred.