Coranex
862292

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BUDGET SUMMARY

GENERAL OVERHEAD

Wages (5 employees)	$ 48,000*
Office Costs (rent, light, heat, phone janitor)	5,000
Office supplies and equipment	1,000
Laboratory equipment	9,000**
Travel	1,500
Toronto charges	2,500
Reconnaissance travel, miscellaneous	3,000
	$ 70,000

*The permanent employees included in the wages are:

J. R. Woodcock - geologist
R. H. Janes - geologist
C. Chun - chemist
C. Campbell - geologist
M. Brooks - secretary

Mr. Nick Wychopen, prospector, also works most of the year, but his wages are charged against the project on which he is working.

**The estimate includes $9,000 for chemical equipment. We expect that our laboratory profit will pay for this, but the anticipated laboratory income has not been included because we have no other reserve for contingencies.

limit work. perhaps a bit more.

TOTAL BUDGET ESTIMATES

General Overhead	$ 70,000		
Peach Lake	41,000		
Cariboo	35,000		
Cub Creek	19,000		
Klazan	28,500	Alternative Big Creek	$ 86,000
Dawson Range	94,500		
Totals	$288,000		$ 251,000

$123,000

does this include Klazan.

JBR prefers $250 000 concentrate central BC

Dawson Range will keep for a couple of years

Possible Supplemental Drill Budgets:

Peach Lake	$35,000
Cub Creek	$44,000

285
945
1230

123
86
37

288
251
37

cordeyera

GEOCHEMICAL LABORATORY

PERFORMANCE IN 1966

For the 1966 season we maintained a functioning laboratory in Vancouver under the supervision of Conway Chun. The laboratory was set up to do total extraction (perchloric acid digestion) for copper, molybdenum, lead, and zinc. In addition it ran silt or soil samples for THM or Holman copper and some water samples for molybdenum. A crusher and grinder were installed so that we could run rock samples for geochemical values.

In addition to the permanent Vancouver laboratory we had our mobile (camper) laboratory at our base camp on Horsefly Lake in the Cariboo. This laboratory was set up to run the same tests as the Vancouver laboratory; but did mostly total copper and total molybdenum on silt samples. A perchloric acid digestion was also used in the field laboratory. However digestion is not as complete in this laboratory as in the permanent laboratory and if it is used in the future, adjustments will be made. In places where there is severe exploration competition it is almost necessary to have a field laboratory for immediate results, especially in the follow-up phase of the work. Samples from the most favourable areas can be re-run in our Vancouver laboratory.

For the work in the Yukon we had portable kits for the cold extraction of THM, copper and arsenic.

To offset the costs of maintaining a permanent laboratory we did outside analyses at the request of several companies, resulting in an income of $18,500. These companies were (in order of income) Buttle Lake Mining Company, Mining Corporation of Canada, Texas Gulf Sulphur Company, McIntyre Porcupine Mines Limited, Coast Range Explorations Limited, Atlas Explorations Ltd., Delta Exploration, and Mastodon-Highland Bell Limited.

An itemized statement, including estimates for the remainder of the season, for operation of our laboratories in 1966, is as follows:

(A)	Income from laboratory			$ 18,500
(B)	Laboratory supplies		$ 5,500	
(C)	Laboratory equipment		5,800	
(D)	Laboratory construction		1,900	
(E)	Laboratory help -			
	1. summer mobile lab. help	$ 2,000*		
	2. summer Vancouver lab. assistants	1,600*		
	3. part-time help	3,200*	6,800	
(F)	Chemist's salary	7,000	7,000	
	Grand Total		$27,000	$ 18,500

*10% has been added to the figures for vacation pay, pension and unemployment insurance, etc.

The above laboratory equipment includes one Nikon petrographic microscope which is not part of the geochemical equipment, the crusher and grinder, a Mettler analytical balance, and an oven dryer. The laboratory construction was mostly on the shell and ventilation system for the crushing room, but did include improvements to our warehouse space and our drafting room. All outside assays have been charged to "laboratory supplies".

The two divisions, "laboratory equipment" and "laboratory construction" are non-recurring items and if they are removed from the statement one will note that Coranex Limited paid very little for their own geochemical analyses. In our work in British Columbia and the Yukon we collected about 6000 silt and soil samples and these were each analyzed for about three elements. In addition the laboratory ran some rock samples for geochemical values and at present is re-running some of the 1965 Yukon samples with the hope that the more complete digestion will pick out some subtle anomalies.

The Vancouver laboratory also has the important function of training students who can then run our field laboratories in following seasons.

FUTURE PLANS

The commercial assay laboratories in Vancouver have so much business that one must wait several weeks for results. Consequently several exploration companies have set up their own assay laboratories and others are considering similar action.

We hope that in 1967 we will be able to do our own assaying for copper and for molybdenum and with this in view, Conway Chun is attending a Night School course in assaying techniques.

We initially set up our Vancouver laboratory with an inexpensive fume hood which was not designed for perchloric acid fumes. We have had no trouble in our first season of work and do not expect any in the future. However, at present the output of our laboratory is limited by capacity of the fume hood. Assaying will further restrict our geochemical output. I recommend that we install a second fume hood of stainless steel. This hood will be suitable for perchloric acid fumes and will eliminate a future bottleneck in the laboratory.

Judging from the number of exploration companies that approached us to do their analytical work in 1966, one could easily obtain unlimited work to maintain a laboratory. However in the 1967 season we will be analyzing numerous soil samples from the Peach Lake Project, samples from our reconnaissance projects, rock samples from the Klazan group and any assays for copper and molybdenum. If we are going to offset the overhead by doing outside work, we must speed up our output. This could be done by using an atomic absorption machine. Nearly all of the private and commercial assay and geochemical laboratories are now using these machines. We have discussed their advantages with several laboratory supervisors and Conway has appraised the various machines available. We recommend purchase of a Perkin-Elmer 303 atomic absorption machine and we believe the outside work in 1967 will cover the extra cost.

Estimated costs for the laboratory improvements are:

(a)	Install stainless steel fume hood	$ 2,000
(b)	Perkin-Elmer atomic absorption machine	$ 7,000

QUESNEL PROJECT (1966)

INTRODUCTION

In our 1966 exploration program the main emphasis, for several reasons, was in the Cariboo country. The area has subdued topography with considerable overburden and vegetation and should therefore be more suitable for a geochemical approach than for a conventional prospecting approach. Numerous roads cross the area and lakes are scattered throughout so that helicopter transportation is not necessary. Moreover, when one finds a mineralized zone the cost of bringing in bulldozers or drills is relatively cheap. Geologically we thought the area should be suitable for the occurrence of a stockwork molybdenite deposit or a disseminated copper deposit. Because there were many geological similarities between the Cariboo-Bell copper deposit and the large relatively high grade Galore Creek copper deposit we hoped for a "syenite copper" deposit rather than the conventional pyrite-rich perphyry copper deposit.

PROCEDURES

In planning the program, we decided to do a detailed coverage of relatively small geologically suitable areas, rather than a sparse coverage of a large area. By examination of the geological literature and consideration of the known mineral showings, some of which were under investigation, we picked several areas for sampling, but did not succeed in covering all of the targets. Unfortunately, in the 1965-1966 winter a large staking rush to the area eliminated some of our potential ground.

Because of the severe competition in the Cariboo area in the 1966 field season, it was necessary to stake numerous claims on anything of interest before doing adequate follow-up work.

In our 1966 program we gradually refined our sampling techniques and instead of merely differentiating between "silt samples" and "soil samples", we distinguished a "gully sample". This is essentially a soil sample under the black A-horizon in the bottom of a gully. During the wet seasons surface waters would have seeped through this soil or have flowed on the surface in the gully and thus the metal content may reflect upstream conditions.

All silt samples collected were run in our mobile field laboratory for total copper and total molybdenum, using a perchloric acid digestion. Most of the samples were also run for THM and some of them were run for Holman copper.

RESULTS OF PROGRAM

The areas which we covered geochemically (Figure 2) included some exposures of granodiorite along the Narcosli River, directly west of but across the Fraser River from the Gibraltar Mines property. No significant anomalies were found in this area.

The Swift River area, north of the Quesnel River was chosen as a possible region for molybdenum deposits, mainly because it contained some northwest structures similar to the one that was mineralized on the Rusty group of claims. The work in the Swift River area yielded some fairly good molybdenum anomalies and some heavy metal anomalies. Follow-up work indicated that these anomalous metal values were probably coming from black slates. Samples of the black slate have been collected and will be analyzed to confirm this interpretation.

Some small copper anomalies were found in the area south of Quesnel Lake. The discovery of widespread minor disseminated chalcopyrite around Peach Lake resulted from the follow-up of one of these anomalies. After staking claims in the area, prospecting led us to some interesting copper mineralization.

The results of the Quesnel Project will be described more fully by Mr. R. H. Janes in a forthcoming report.

THE PEACH LAKE PROJECT

LOCATION

The main copper showing is in the middle of a large group of claims at latitude 51° 57' N, longitude 121° 19' W in the Clinton Mining Division. The nearest town is Lac La Hache, 15 miles to the southwest.

Access can be gained from Lac La Hache via the Murphy Lake Road for 16 miles, then eastward from Rail Lake for another six miles. This last six-mile leg of the route crosses a timber lease for the first mile and then mineral claims belonging to Coranex Limited for the last five miles. The first mile is a logging road belonging to Weldwood of Canada Limited. The engineer in charge of leases has granted us written permission to use the road and has stated that the timber lease will lapse in July, 1967. The last five miles of access road were made for Coranex Limited.

GEOLOGY

Rock Types:

Work by the Geological Survey of Canada (Map 3-1966) indicated that, in the vicinity of our claim group, a granodiorite batholith intrudes Mesozoic volcanics (Nicola Group). The contact, between the batholith on the east and the volcanics on the west, has a northwesterly strike.

In our geological mapping (Figure 3) we have differentiated three distinct intrusive groups. These include the quartz-rich granodiorite of the main batholith, a massif of coarse-grained hornblende—syenite and small bodies of "meta-syenodiorite".

The western boundary of the granodiorite batholith strikes north—south. It appears to contact the coarse-grained syenite and the Mesozoic volcanics. However, along the east side of our claim group, a band of paragneiss occurs between the granodiorite and the volcanics.

The massif of coarse-grained hornblende-syenite extends westward from the batholith contact. It crops out along the north sides of Spout Lake and Peach Lake and to the south of Murphy Lake. It contains minor disseminated chalcopyrite near Peach Lake.

The syenite-diorito bodies and the dioritized volcanics are of major interest economically as the best chalcopyrite mineralization is associated with them. They occur south of the syenite massif in an east—west zone about three miles long and two miles wide.

The Mesozoic volcanics, in the vicinity of our claims, are largely pyroclastics which contain abundant calcite. Contact metasomatism has locally silicated some of the volcanic rocks and some of the paragneiss.

Alteration and Mineralization:

The syenite and diorite appear to grade laterally through dioritized or syenitized volcanics into volcanic material. We have employed the field terms 'metadiorite' and 'metasyenite' for these intrusive rocks.

Throughout the volcanic terrain there are widespread pockets of epidote, often with minor associated chalcopyrite, and also widespread occurrences of partial or complete alteration toward syenite or diorite. Locally disseminated chalcopyrite is associated with this latter type of alteration. In addition to the pervasive alteration, there is some orthoclase alteration along fractures. The pervasive syenitization and the orthoclasation along fractures have been called orthoclase-flooding at the Cariboo-Bell property.

At present we have only found one copper showing in which the chalcopyrite occurs partially in fractures (Peach #1 showing). At this showing there is considerable orthoclase-flooding of both the pervasive type and the apparently fracture-control type. There is abundant epidote and there is also widespread tourmaline, both as pockets of radiating crystals in the altered rock and as felted layers along fractures. A minor amount of biotite along fractures has been noted.

One might compare some of the alterations at this deposit with other copper deposits throughout British Columbia. As previously stated the metasyenite and the orthoclase-flooding are very similar to that found at the Cariboo-Bell deposit. Orthoclase alteratioa and biotite alteration are very important at Galore Creek where the mineralization is related to a stock of syenite porphyry. Tourmaline alteration and orthoclase introduction are present in the Craigmont orebody which is generally considered a skarn or pyrometasomatic deposit. Tourmaline alteration has also been reported for the Bethlehem copper deposit.

A few assay results are available. A grab sample of relatively well-mineralized rock taken during the initial brief inspection ran 0.55% copper and 0.04 oz. gold. Subsequently a trench, 40 feet long, was dug and blasted on the north side of the mineralized hill. Samples taken by R. H. Janes assayed 0.2% copper across 31 feet, with reported gold values of trace or 0.01 oz.

GEOCHEMISTRY

In our preliminary work on and around the Peach Lake claim group, we made traverses to map the geology and we collected gully and silt samples along these traverses. In addition we did some soil sampling on a small grid over the main showing. From the geology we concluded that the mineralized zone possibly had an easterly strike and our minor amount of soil sampling over the main showing appears to confirm this conclusion. Because of the lack of pyrite and the lack of oxidation, geochemical values both in streams and in soil are relatively subdued. However there is a geochemical anomaly over the main showing. It appears to be about 500 feet wide and extends 1000 feet to the west of the showing and over 1000 feet (the limit of our soil survey) eastward from the showing. The anomaly is a zone of erratically mixed copper values varying between 30 ppm and 1000 ppm.

Our sketchy sampling of gullies revealed a highly anomalous drainage about one mile south of the Peach #1 showing (on the south slope of a hill containing considerable silicated volcanics and some syenitized rock) and also another good gully anomaly about one mile west of the showing.

The best results obtained in the silt and gully sampling are from a drainage nearly five miles east of the Peach #1 showing. These small creeks and gullies drain an area of paragneiss, locally silicated, adjacent to the contact of the granodiorite. There are very few rock exposures in this drainage area so we are presently having it soil sampled. However while staking the claims the prospector found minor disseminated bornite in silicated rock about 2½ miles northwest of this anomalous drainage basin.

CONCLUSIONS

The widespread occurrences of minor disseminated chalcopyrite throughout our claim group; the extensive syenitized volcanics and metasyenites similar to those found at Cariboo-Bell; the occurrence of silicated rocks, some of which carry minor disseminated bornite; and the presence of good copper geochemical anomalies in some gully samples make most of our Peach Lake claim group worthy of some detailed investigations.

The Peach #1 showing with chalcopyrite occurring in fractures and as disseminations in the orthoclased rock, with rock alteration similar to many other important copper deposits, and with the presence of a soil geochemical anomaly make this showing worthy of some bulldozer trenching and also a good central place to set up camp for investigation of the surrounding ground. With this in mind we built the access road from Rail Lake.

RECOMMENDATIONS

The Peach #1 showing may not necessarily be the best showing on the property and the exposure may not be the best part of that prospect itself. Our preliminary mapping in the fall, indicated that the zone of major interest is anout two miles wide and about three miles long. This zone, and the anomalous area near the batholith contact warrant some detailed surface investigations. First, the area should be geologically mapped and all the gullies should be sampled to select the best parts. Magnetometer work, soil sampling and detailed geological mapping should be done in the choice areas. This should be followed by bulldozer stripping and ripping.

At both Galore Creek and at Cariboo-Bell, induced polarization surveys yielded strong anomalies which turned out to be pyritic zones. However, at both of these properties, the zones with the best chalcopyrite mineralization yielded intermediate I.P. anomalies. The I.P. at Galore Creek, when reinterpreted in the light of the information from the first drill program, was successfully used to guide the subsequent drill programs. Thus I.P. may be valuable in picking the best part of a large copper geochemical anomaly and should be employed to help define targets, possibly before any stripping program, but definitely before any drill program.

The crew that we plan for the Peach Lake program is as follows:

R. H. Janes — supervision
1 temporary geologist -- graduate student
1 student -- magnetometer survey and drafting
2 students -- blazing lines, soil sampling, etc.
1 cook

In addition, Nick Wychopen will work early in the spring and late in the fall, and some of the students for the Yukon projects will work on this project in May.

PEACH LAKE BUDGET

General Program (Phase I)

Wages for temporary crew	$ 11,500
Food	4,000
Travel and accommodation	1,000
Transportation	1,000
Haulage	500
Purchase power wagon	5,000
Field equipment and supplies	1,500
Radio and telephone	500
Geochemistry and assays	4,000
Magnetometer rental	1,000
I.P. work (15 miles @ $300 per mile)	4,500
Bulldozer (includes snow removal before break-up)	5,000
Claim costs	500
Miscellaneous	1,000
	$ 41,000

Drill Program (Phase II)

5000 feet @ $6.00 per foot for BX wireline	$30,000
Miscellaneous (camp costs, drill extras, assaying, etc.)	5,000
	$35,000

CARIBOO RECONNAISSANCE (1967)

INTRODUCTION

The Quesnel reconnaissance program of 1966 covered only a very restricted area of the Cariboo, mainly because the work was done in great detail and because much of the terrain was densely forested and difficult to traverse. However from our work we can draw some very important conclusions about the potential of the area and about the type of program that should be conducted in the future.

CONCLUSIONS

The Cariboe, especially the geologically potential part between Bonaparte Lake and Prince George was the object of silt sampling programs by numerous companies, some of which were supported by helicopters. It is too early to assess the outcome of this work but we believe that our program was more successful than most others in locating favourable mineralization.

The search for stockwork molybdenum deposits was disappeinting and in the future we may place less emphasis on it when choosing our geological targets. However we automatically test all silt samples for molybdenum and late in the season we began to run the molybdenum-in-water test.

"Syenite copper" deposits could become a major asset in the Cariboo area. Certainly the one at Cariboo- Bell has aroused a lot of interest. These deposits are associated with "meta-diorite" and "meta-syenite" which are easily distinguished in hand specimen from the quartz-rich granodiorite. The coarse-grained hornblende syenites north of Spout Lake do have disseminated chalcopyrite in many places but at present do not appear very attractive. These rocks are also easily distinguishable in hand specimen both from the granodiorite and from the meta-syenodiorite series.

It is important to note that in most places the mapping done by the Geological Survey of Canada has grouped these three intrusive rock types under one formation, only occasionally depicting the syenite as a sub-group. Thus the large areas of Mesozoic acidic to intermediate intrusive rocks between Bonaparte Lake and Prince George and the areas of Mesozoic volcanics which are intruded by these rocks may contain some of the important meta-syenites or meta-diorites.

In general, the "syenite copper" deposits contain very little pyrite and at Peach Lake the chalcopyrite is essentially the only sulphide present. When no pyrite is present, oxidation is reduced to a minimum and mobility of the copper ions is almost nil. Thus the geochemical values obtained in streams are relatively low and an interesting mineralized zone could be easily missed in reconnaissance geochemistry.

RECOMMENDATIONS

The Cariboo reconnaissance geochemical program should be continued in 1967 but it should be altered to take advantage of our new knowledge of this area. In addition to doing a geochemical coverage of the geological targets that have been picked from the literature we should choose areas of meta-diorite and meta-syenite for a more detailed investigation. This detailed investigation would include geological mapping with prospecting on a scale of about 1" = ½ mile, detailed geochemical sampling of all gullies and creeks and possibly some soil sampling at chosen spots. In some cases it will be necessary to stake claims during this investigation.

There are two ways of finding the areas of meta-diorite and meta-syenite. One is to make widely spaced traverses, possibly at one mile intervals, in the areas that have been mapped as intrusive rocks. The other method would be to examine all the hand specimens collected in the Cariboo area by Drs. R. B. Campbell and Tipper of the Geological Survey of Canada. Dr. Campbell has his suite of rocks in Vancouver and Dr. Tipper has his suite of rocks in Ottawa. With regards to this latter proposal I would like to mention that, when visiting Dr. Campbell in Vancouver to discuss some rock types of the Cariboo area, I looked briefly through one of his trays of rocks and noted two specimens which he had included in his granodiorite group and which Dick Janes and myself have been mapping as meta-diorite. These rocks were from the northwest corner of Murphy Lake. On the same day, a prospector phoned Dick Janes to inform him that he had claims at the northwest end of Murphy Lake for sale and that he had found some disseminated copper on the claims.

The program should also include additional follow-up work on some small copper anomalies north of the Peach Lake claims.

The camp for the Peach Lake project will serve as a base for the Cariboo reconnaissance work.

The crew recommended for this work is as follows:

Geologist -- R. H. Janes

2 student geologists (graduate and undergraduate)

4 students for soil and silt sampling

CARIBOO BUDGET

Wages for temporary crew	$ 12,200
Food	4,500
Travel and accommodation	2,500
Transportation (includes one rental)	4,300
Field equipment and supplies	1,000
Radio rentals and telephone	500
Plane charters	3,000
Geochemistry and assays	5,000
Claim costs	2,000
	$ 35,000

ALICE ARM—STEWART WORK

INTRODUCTION

In the fall of 1965, I spent two weeks with a helicopter based at Stewart, British Columbia. I examined gossan zones, collected a few grab samples of rock from the zones and collected silt samples from the drainages of the gossan zones. Subsequent analyses for molybdenum in our Vancouver laboratory showed a few small anomalies.

In 1966 I planned to re-check some of the anomalous areas, using a helicopter that was based in Alice Arm. In addition, I picked some small areas around Alice Arm for detailed prospecting by Nick Wychopen and a student assistant. Before Nick started his work, we visited the Roundy Creek prospect so that he could observe the hornfels alteration adjacent to the mineralized stock. Nick collected hand specimens of rock at intervals along his traverses and he also collected silt samples in drainages. I examined the hand specimens at Alice Arm for possible hornfelsing and shipped them to Vancouver where some of them will be examined in thin section.

Unfortunately, during the two weeks that I was in the vicinity of Alice Arm the coastal weather was so poor that we could not get into the area of glaciers and the small anomalies near Stewart. Consequently the geochemical follow-up work was not completed. However, Nick was able to get his camp into the target areas that I had picked near Alice Arm and completed that part of the work.

The Alice Arm—Stewart area has been the target of considerable prospecting in the last two years. In 1965, Newmont Mining Corporation of Canada Ltd. had a geochemical laboratory in Alice Arm and did a detailed sampling program of the surrounding area. In the 1966 season a Newmont prospector continued work in the region, probably investigating anomalies obtained in the previous season. In the past season, Amax Exploration Inc. had a helicopter-supported geochemical program with a base camp four miles north of the town of Alice Arm and Kennco Explorations (Western) Limited had a helicopter-supported geochemical program along the Nass River to the east. There was keen competition between the Amax crew and the Kennco crew and both outfits staked claim groups on anomalous areas.

CORANEX RESULTS

Seven small areas were picked near Alice Arm for detailed prospecting. Target areas, as shown on the accompanying geological map (Figure 4) include the Kitsault Lake area, the Lyall Creek area, the Tidewater area, the Theophilus area, the Clarey Creek area, the Summit area and the Kwinatahl River area.

The following factors were used in selecting the small target areas:

(a) The areas were below timber line where any gossan zones would not form conspicuous targets.

(b) The target areas were underlain by graywacke which, when metamorphosed by an intruding acidic to intermediate stock, changes to a brown biotite hornfels.

(c) Most of the areas, according to Hanson's published geological map, were within the vicinity of some east-west flexures in this region where the main geological structures strike north-northwesterly.

(d) In some places, the air photos were examined to find areas where the conspicuous massive graywacke beds were broken or contorted.

I examined the hand specimens at Alice Arm but did not see any interesting hornfels except possibly for some specimens in the Tidewater area. As this target area is adjacent to the batholith, the samples will have to be plotted to determine their proximity to the contact and some thin sections will need to be examined.

Most of the specimens collected from the Kitsault target area are volcanic rocks which do not form biotite hornfels adjacent to acidic stocks. However Nick Wychopen did find some interesting barite mineralization in limestones near the southeast shore of Kitsault Lake. We have staked 17 claims to cover this mineralization and the surrounding area.

KITSAULT BARITE PROSPECT

The prospect, which is 14 miles northeast of the margin of the Coast Crystalline Belt, is at the intersection of a prominent north-south structure along the Kitsault River and a northeasterly structure that would run along the Kshwan River and Kitsault Lake. Sedimentary rocks and volcanic formations crop out in the area. They are interbedded and probably also faulted into juxtaposition.

On the northeast end of a sharp knoll some banded limestone which dips gently to the northwest, has been partially replaced by barite. The replaced rock is thinly banded and the bands are crumpled and folded.

A fault probably separates the mineralized limestone from the volcanic breccia to the south. The mineralization may be localized along the fault, or it may dip northwesterly under the outcrops of barren limestone (see Figure 5).

The barite—limestone rock has numerous discontinuous minute fractures that are coated with very fine-grained pyrite. Additional fractures which are relatively strong and about one-sixteenth of an inch wide are filled with orange realgar (AsS). In addition to this showing, there is an exposure of barite—limestone in the creek bed about 500 feet to the north. Pyrite-rich bands and ressish jasper replacements occur in the exposure in the creek bed. redish

This prospect is in a silver camp and, to a lesser extent, a gold—copper camp. The Torbrit Silver Mine produced sixteen million ounces of silver and about eight million pounds of lead, mostly in the period 1949 to 1957 when it was operated by Mining Corporation of Canada.

Argentite was the important silver bearing mineral at the Torbrit Silver Mine and barite and jasperoid were important parts of the gangue.

Several representative chip samples or character samples from the Kitsault prospect were assayed for gold and silver but the results were nil or trace. The samples included five chip samples taken down the exposure of barite-rich rock at the "Discovery" prospect, some of the pyrite-banded rock from the "Creek" showing, and some of the jasper-rich rock from the "Creek" showing.

CONCLUSIONS AND RECOMMENDATIONS

The preceding review of the activity in the Alice Arm—Stewart area indicates that much of this region has been adequately explored by silt sampling and that any further exploration should employ some additional techniques.

The field work that I did near Stewart in 1965, examination of a few thin sections, the minor amount of work that I did near Alice Arm in 1966, and discussions with other geologists who were working in the Alice Arm—Stewart area, leads one to conclude that most of the conspicuous gossan zones, especially those near Stewart, are caused by carbonatized and pyritized volcanic rocks. Many of these carbonatized zones yield small geochemical anomalies in molybdenum, etc. It would take an experienced field geologist a great deal of time to examine these gossan zones and pick out any that would merit investigation for stockwork molybdenite deposits. Possibly, where interbedded sedimentary rocks are present, the presence or absence of hornfelsing would indicate whether or not the alteration is related to an intrusive stock. If not, the chances of finding a stockwork molybdenite deposit are slim.

In spite of the favourable appearance of the mineralized limestone on the Kit claims, the absence of any silver or gold values in the assays discourages one from further work. The present reaction is to allow the claims to lapse. However the claims, especially the showing in the creek bed, have not been thoroughly prospected. I hope to get more information on the distribution of values within the "vein of gangue" and mineralized "ore pod" at the Torbrit Silver Mine and will review the data this winter.

CUB CREEK PROJECT

LOCATION

The sulphide float and a Turam electromagnetic anomaly lie six miles southwest of Mile 1043 on the Alaska Highway. The closest settlement, Haines Junction, is at Mile 1015 on the Alaska Highway, 116 miles by road from the port of Haines in Alaska. The sulphide float lies along the southwest side of the Shakwak valley at an elevation of 4400 feet. It is at latitude 60° 55', longitude 138° 13'.

A bulldozer road about ten miles long connects the property with the pipeline road southwest of the highway. The pipeline road is accessible from the north, with a 4-wheel drive vehicle. In the dry season, the first nine miles of the bulldozer road are also accessible with 4-wheel drive vehicles.

CLAIMS AND ASSESSMENT WORK

The following 58 claims, (Figure 6) were staked and transferred to Coranex Limited on the respective dates:-

Cub 1 to 8 inclusive, July 27th, 1965
Cub 9 to 24 inclusive, July 23rd, 1965
Cub 25 to 32 inclusive, September 17th, 1965
Tel 1 to 16 inclusive, March 31st, 1966
Tel 17 to 26 inclusive, June 17th, 1966

The line cutting and geophysical work done in 1965 were applied to the assessment work. The assessment due dates are shown on the accompanying claim map (Figure 7). In general, seven claims which cover the sulphide float and the Turam electromagnetic anomaly (Cub #'s 16, 18, 20, 22, 26, 28, and 32) are good until September and October of 1969. Cub #30, which is an important claim, lapses on September 17th, 1968. Twelve of the claims (Cub #'s 1 to 12 inclusive) lie along the southwest side of the claim group and were allowed to lapse on October 23rd, 1966. The remainder of the claims lapse throughout 1967 and 1968 as shown on the map.

EXPLORATION HISTORY

Prospectors working for the Gaymont Prospecting Syndicate discovered massive sulphide float in Cub Creek in 1955. Prospecting up Cub Creek and around the glacier at the head of the creek failed to locate additional float or the source of the known float.

In 1956, Dr. Clark did a resistivity survey along Cub Creek above the sulphide float. He discovered a zone of discontinuous conductors about 1500 feet up the stream from the sulphide float. Three drill holes in the glacial debris failed to reach bedrock.

When the ground lapsed, Canex Aerial Explorations Limited staked it. Hunting Survey Corporation Limited did a Turam survey and confirmed the conductive zone found by Clark. Two vertical churn drill holes, approximately 190 feet deep, were drilled in some highly sheared rock at the southeast end of the conductive zone — no sulphides were encountered.

In 1964 the Meridian Syndicate acquired the ground but allowed the claims to lapse in 1965.

Coranex acquired the ground by staking, in 1965, and the writer examined the property in September of 1965. In the summer of 1966, H. O. Seigel & Associates did a Turam survey over some possible source areas for the sulphide float.

GENERAL GEOLOGY

The boulders of sulphide float occur in a restricted area about 600 feet long in the bed of Cub Creek, at the toe of a rock glacier or terminal moraine. The boulders are mostly angular and have an average grade of 1.6% copper plus 4.4% zinc.

The float is on a high, wide bench along the southwest side of the Shakwak valley. There are no outcrops in the vicinity of the float. The closest outcrops are the basaltic rocks in the bed of a creek 3000 feet to the southeast. One of these ontcrops consists of fairly fresh and unaltered basalt; however, upstream from this outcrop there is a large area of highly sheared basic lava.

From the regional geological map it appears that the area of sulphide float lies between the Shakwak Fault on the northeast and a regional southwesterly-dipping thrust fault on the southwest.

There are three directions of glacior movement that could have brought the sulphide float to its present position. The first of these would be northwesterly movement along the Shakwak valley. Easterly movement of ice out of some cirques west of the float could have taken place during and after the ice movement along the Shakwak valley. The latest glacial deposits would be the ridges of debris that lie along Cub Creek. These are either lateral and terminal moraines or rock glaciers that came out of the cirque at the head of Cub Creek.

GEOPHYSICAL RESULTS

The geophysical work for the Gaymont Syndicate tested the possibility of a source area along Cub Creek and the geophysical work done for Canex Aerial Explorations Limited merely confirmed the conductive zone found by the Gaymont Syndicate.

The Turam survey done for Coranex Limited intended to test possible source areas in the immediate vicinity of the float, either from the southwest along the side of Shakwak valley or in the direction of the cirques to the west. It also covered the conductive zone previously found.

The survey done for Coranex Limited by H. O. Seigel & Associates Ltd. was based on a square loop transmitting wire, rather than a long wire and the results were interpreted by Dr. R. A. Bosschart. Dr. R. A. Bosschart also appraised the results of the long wire Turam survey done by Hunting Survey Corp. Ltd.

The conductive zone found for Gaymont Syndicate and subsequently confirmed for Canex Aerial Explorations Limited did not show up in the present survey. However a small (at least 400 feet long) zone of good conductivity showed up southeast of the sulphide float. The conductor is about 1600 feet from the sulphide float and it is on "glacial strike" along the side of the Shakwak valley. Depth of overburden above the conductor would probably be in the order of 200 feet.

CONCLUSIONS AND RECOMMENDATIONS

Dr. R. A. Bosschart interpreted a short zone of good conductivity dipping to the northeast and he recommended that we test the conductor with two 400 foot holes dipping 50° to the southwest.

We are obliged to the Geophysical Department of Canadian Nickel Company for appraising the anomaly at our request. The following is their appraisal (G. W. Thrall, August 15th, 1966):

> "The conductor marked "A" on the plan showing the results of the Turam electromagnetic survey is a legitimate conductor caused by conductive material in the ground.
>
> "The conductor could very well be a sulphide body and thus possibly the source of the float found down ice near Cub Creek.
>
> "The upper surface of the conductive body appears to be at least 400 feet long, possibly longor. This could of course, increase with depth. The Turam results are not strong, but this is to be expected with heavy overburden over a body of short strike length. The conductivity of the body appears to be good.
>
> "The continuing response northeast of conductor "A" might suggest that conductor "A" is merely the edge effect at the edge of conductive material in the overburden. However, it is felt that a conductive body underneath the overburden is the more likely interpretation.
>
> "A drilling recommendation on conductor "A" will depend on the assays obtained from tha float near Cub Creek.
>
> "No other conductors of interest occur in the Turam results."

Because of the great depth of overburden in this area, drilling an angle hole by large conventional type drills will be very costly. The overburden would need to be drilled with a tri-cone bit and with mud, and costs would be in the order of $25 a foot plus mobilization and camp expenses. In view of these high costs for a large drill we should attempt to test the conductor with a Nodwell-mounted overburden drill. United Geophysical Company, who did the drilling on Dynasty's claims, have Mayhew 1000 seismic drills mounted on Nodwells available in Whitehorse. Because these rigs are mounted on tracked vehicles, the existing bulldozer roads would be adequate and the vehicles could rapidly move into the area in an attempt to test the anomaly. The rigs are convertible to standard NX drill equipment which can be used when bedrock is reached.

Because these rigs can only drill vertical holes and because the stations for the Turam survey are 100 feet apart, it would be advisable to pinpoint the peak of the anomaly before trying to test it with a vertical hole. Possibly the quickest way to do this would be to run a couple of gravity profiles across the anomaly. This could also be done by United Geophysical when one of their geophysicists is availavle in Whitehorse.

If the drill cuts an interesting section of sulphides, we should then acquire additional ground to the northwest and to the southwest of our present claim group. At least 200 more claims should be staked.

CUB CREEK BUDGET

Checking Anomaly (Phase I)

Geophysics	$ 500
Camp supplies	500
Food	500
Travel and accommodation	500
Camp equipment	500
Wages (cook, assistant)	1,000
Transportation	500
Mobilization	1,000
1500 feet drilling	12,000
Reserve for contingencies	2,000
	$ 19,000

Subsequent Drilling (Phase II)

Drilling	$ 30,000
Wages	2,000
Camp supplies	1,000
Food	1,000
Transportation	1,000
Claim costs (200 claims @ $30 each)	6,000
Reserve for contingencies	3,000
	$ 44,000

KLAZAN PROJECT

INTRODUCTION

The Klazan Group of 48 claims is 45 miles northwest of Carmacks, Yukon Territory. These claims, staked in June of 1966, cover an area of anomalous geochemical values and quartz stockwork exposures.

The area was found in 1965 by investigating a THM anomaly in silt. Soil samples taken along the valley sides yielded anomalies in THM, copper, molybdenum, and arsenic in a rhyolite porphyry. Prospecting led to the discovery of quartz stockwork and occurrences of minor galena and sphalerite. However samples yielded no significant assays for important metals and the claims were not recorded.

In 1966 Colin Campbell, with two student assistants, spent about five weeks on the property. They did some geological mapping, additional soil sampling and some hand trenching in the anomalous zones. In one of the zones, Colin found molybdenite in quartz veinlets (with traces of lead) and also in pockets and fractures. The results of this work are described more fully by Colin in a separate report.

The geochemical work and the trenching will provide assessment work for one year for most of the claims.

GEOLOGY

The claim group is in the centre of the Dawson Range, two miles southwest of the Big Creek lineament or fault zone. It is within the area of very complex intrusive and tectonic history along the southwest side of Big Creek.

On the claim group, a narrow band of rhyolitic rocks striking westerly, sub-parallel to the Big Creek lineament are bounded on the northeast and the southwest by elongate bodies of syenite. There is evidence of considerable shearing along the northeast part of the rhyolitic band. There has also been considerable sericite alteration and the introduction of some quartz into a stockwork which itself has been sheared. Sulphide mineralization includes pyrite and minor molybdenite, galena, and sphalerite. A pyrite-rich post-ore (?) porphyry intrudes the central part of the sheared and altered zone.

Quartz monzonite porphyry crops out at the southeast end of the sheared zone (at the edge of our claim group). This small area of quartz monzonite porphyry may be the northwestern corner of the much larger "granitic" area shown on Bostock's map.

Although no ore-grade values for molybdenum have been obtained from this highly weathered area, most samples of the sericitized rhyolitic rocks, and all samples of the quartz monzonite porphyry, especially the sericitized porphyry, are geochemically anomalous in molybdenum.

CONCLUSIONS

For a stockwork molybdenite prospect, especially in those as poorly exposed and as highly weathered as the Klazan prospect, one must weigh the favourable features against the unfavourable features in deciding the extent of exploration work that is warranted. For the Klazan prospect, one might point out the following favourable features:

(a) There is an extensive zone of hydrothermal alteration to sericite and kaolinite.

(b) There is an almost coextensive zone of quartz stockwork, which in some specimens forms 50% of the rock.

(c) Molybdenite occurs in some of the quartz veinlets and in a few irregular fractures along the southeast side of Burgis Creek.

(d) A very favourable looking quartz monzonite porphyry crops out at the southeast end of the zone.

(e) There are anomalous molybdenum geochemical values in the weathered rock samples, both from the zone of sericitized rhyolite and from the quartz monzonite porphyry*.

(f) Galena and sphalerite are generally introduced with either a quartz or a carbonate gangue in the last phase of mineralization for practically all economic stockwork molybdenite deposits.

(g) The general area has a very complex tectonic and intrusive history.

The features which, at present, appear to be unfavourable are as follows:

(a) The quartz stockwork and sericite alteration might be in a linear zone rather than an equidimensional or circular zone. However one must note that the Endako deposit, at surface, is a definite linear zone.

(b) Most of the observed quartz stockwork and the rock alteration occur in rhyolitic rocks. However at the Lucky Ship prospect (Morice Lake, British Columbia), the porphyry plug and some of the peripheral mineralization occur within rhyolitic rocks of volcanic or sub-volcanic origin. Amax Explorations Inc. must have spent nearly half a million dollars in investigating this prospect.

(c) The geochemical molybdenum values from the silts are relatively low. However this is expected, unless the streams cut right across the ore zone.

(d) Although quartz-molybdenite veinlets (blue quartz veinlets) and fracture-filled molybdenum veinlets are present and the molybdenite is as fine-grained as that found in some stockwork molybdenite deposits, we have not observed any powdery molybdenite "paint".

*In some of the well-zoned circular stockwork molybdenite deposits, samples with 100 ppm molybdenum-in-rock are only a few hundred feet away from the ore zone.

However if such molybdenite were present we would not find it at the surface in this weathered rock and rubble which we have been using in our mapping and sampling.

(e) Barite is present in quartz veinlets and in fractures and has not been reported from other deposits.

(f) Hydrothermal orthoclase has not been found. However, the Urad deposit and the Endako deposit have mostly sericite--kaolinite alteration.

When one reviews the above favourable features and rationalizes a few unfavourable features*, he must conclude that the mineralized and altered zone on the Klazan claims, and the quartz monzonite stock to the southeast warrant additional investigation. This investigation should be extended to include a zone along the southwest side of Big Creek that has an overall length of about 15 miles.

RECOMMENDATIONS

The basic part of the investigation should be a program of bulldozer stripping guided by additional geochemical work, geological mapping and prospecting. There should be a main base camp on Burgis Creek for the work on the claim group, for the work on the 15 mile zone, and for any other follow-up or reconnaissance work in the general area. The camp and the supplies could be moved to this location with a bulldozer pulling a balloon-tired trailer.

I have talked to geologists of Canex Aerial Explorations about their drill programs on Revenue Creek and Granite Mountain in this general area. The work done on Revenue Creek was with a small drill using AX core and the drill job was very unsatisfactory because the drill was not large enough to place casing through the highly weathered and disintegrated rock. The ground is permanently frozen and the drill water melts the ice letting disintegrated rock fall into the hole. At Granite Mountain, a Nodwell-mounted overburden drill, convertible to NX standard core was tried and was not satisfactory. The rock was too hard for successful use of the tri-cone bit and the presence of water prevented successful use of a hammer-type bit. Don Rutheringham concluded that the overburden drill would have worked better on Revenue Creek than it did at Granite Mountain but that the best way to have drilled Revenue Creek would have been to use an overburden drill to get down to the solid rock, put in casing, and then switch to a large core drill. The frozen overburden could then be drilled without water and slumping might be prevented.

We have heard a lot about using a powerful bulldozer with a ripper to get through permafrost overburden. However Gordon Dickson, who did a large program of bulldozer stripping in the Mount Nansen area, has

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*All stockwork molybdenite deposits, even Climax, have some features which do not completely fit my conceived picture of the geologically ideal or typical stock molybdenite deposit.

other advice. He maintains that the only way to get down is to use a strong bulldozer with an ordinary blade and do the stripping in the early summer when there are long hours of sunlight to thaw the ground. He states that one must get several trenches started and then clean them out every day as the ground thaws. He had very adverse comments to make on the use of a ripper in permafrost overburden areas.

For the stripping program in the Big Creek area and for hauling the equipment and fuel to camp, we should have a bulldozer on the job for a period of at least two months. A Caterpillar D 6-C bulldozer with a power-shift transmission has productivity between that of a pre-1959 D-7 and a pre-1959 D-8, and rents in the Yukon for about $24 per hour.

The crew recommended for the Klazan project is as follows:

1 geologist -- (Colin Campbell)

1 student assistant

1 bulldozer driver

1 swamper

1 cook

BUDGET FOR KLAZAN PROJECT

Wages (temporary help)	$ 6,000
Food	3,600
Camp supplies	1,200
Camp equipment	2,000
Radio rental and phone	500
Haulage	1,500
Travel and accommodation	1,500
Transportation	1,200
Claim costs	1,000
Bulldozer	6,000
Trailer	2,000
Geochemistry and assays	2,000
	$ 28,500

The Klazan Project will be integrated with the Dawson Range program of reconnaissance and follow-up work and their proposed budgets are interwoven. Thus the cook's wages and the camp equipment for the main base camp have both been charged to the Klazan Project; all the helicopter costs have been included in the Dawson Range budget, and the bulldozer costs for stripping, both on and off the Klazan group, and for hauling equipment and fuel to the Klazan camp have been divided between the two budgets.

DAWSON RANGE RECONNAISSANCE

INTRODUCTION

The Dawson Range of the southwestern Yukon Territory extends for 150 miles in a northwesterly direction. It is bounded on the northeast by the Yukon River and on the southwest and west by the Nisling and White rivers.

Although the Range is not remote, the central parts are relatively inaccessible. There are no lakes suitable for float planes and there are no all-weather roads excepting the road to Mount Freegold which extends a mere thirty miles into the southeast end of the Range. However the higher parts of the Range have rolling topography with sparse timber and, in these parts, tracked vehicles (Nodwells or tractors) could readily move around without prepared roads.

REGIONAL GEOLOGY

Reconnaissance Mapping

Dr. H. S. Bostock (1936) mapped the southeast end of the Dawson Range; the work is included in his report on the Carmacks map sheet. Gneisses and schists of the Yukon Group, volcanics of Mesozoic age, and plutons of the Coast Range complex underly most of the area and are cut by a variety of Mesozoic to Tertiary intrusions (syenite, diorite, quartz-feldspar porphyries and rhyolite porphyries).

Reconnaissance mapping in the northern parts of the Dawson Range has been somewhat sketchy. D. D. Cairnes (1916) mapped an area between the Klotassin and Yukon rivers and H. S. Bostock (1944) mapped a small area along the Selwyn River adjacent to his Carmacks sheet. This mapping shows the geology to be generally similar to what Bostock found in the southeast part of the Dawson Range; but no Tertiary intrusions are shown on the map. Most likely such large-scale reconnaissance mapping would miss any small porphyry stocks.

The mountains of the Ladue River area are on strike with the Dawson Range and about 120 miles northwest of Big Creek. The geological map of this area (W. E. Cockfield, 1920) shows some rhyolites with associated quartz porphyries and granite porphyries -- an assemblage similar to that found on the Klazan claim group (Figure 8).

Mineralization

Mineralization of the Dawson Range is of three types:

(1) Silver and/or gold prospects such as those found at Mt. Nansen, Freegold Mountain, and Casino Creek.

(2) Disseminated copper such as that found on Granite Mountain and on Revenue Creek (both of these prospects were drilled by Canex Aerial Explorations Ltd.).

(3) Quartz stockwork with molybdenite represented by the prospect on the Klazan Group.

In addition to the lode mineralization, prospectors have recovered some placer gold from many of the creeks throughout the Dawson Range.

GEOMORPHOLOGY

Pleistocene Phenomena

During the Pleistocene ice advances in Western Canada, a large area along the western part of the Yukon Territory remained unglaciated. The glaciers advanced westward and northward to the boundaries of this area. The glacial map of Canada shows the southern boundary lying slightly north of Aishihik Lake and part of the eastern boundary lying in the vicinity of the Mayo Road.

According to this map, our 1965 area of geochemical reconnaissance was largely within unglaciated terrain. However a recent publication by H. S. Bostock (1966) reveals some evidence of an older glaciation extending over a large part of our area of geochemical coverage.

Dr. Bostock, in his publication "Glacial Geology of Part of Central Yukon Territory" has distinguished four glacial advances. From youngest to oldest these are as follows:

(1) The McConnel Advance with the westward limit in the vicinity of the Mayo Road.

(2) The Reid Advance which advanced generally about 20 miles further than the McConnel Advance.

(3) The Klaza Advance characterized by modified glacial landforms in the valleys of the Klaza River and Lonely Creek.

(4) The Nansen Advance represented by deeply weathered drift deposits and having no glacial topographic features. This glacial advance extended up the valley of Hayes Creek, Big Creek, Nansen Creek, etc.

In the Big Creek area, the only glacial features remaining are the weathered deposits of the Nansen drift along the valley sides. Rounded boulders are found on the south slope of Big Creek between Burgis and Etches creeks (on the Klazan Group). Whether these are old stream deposits or old glacial deposits is not known. They appear to overly our interesting zone of alteration.

Weathering

A matter of great importance in exploration geology and geochemistry is the type of weathering characteristic of this "unglaciated", permafrost area. Because of low temperatures, chemical weathering is reduced to a minimum. However because of frost action, mechanical disintegration of the rock is very important.

There is a great contrast between the sunny south—east slopes and the sheltered northwest slopes. As the rock crumbles on the northerly slopes it flows slowly downhill under the influence of solifluction resulting in gentle spruce-covered slopes with shallow overburden covering crumbled rock. Southeasterly slopes however are steep and grass covered.

Overburden is deep and rock outcrops project through the overburden in places. The overburden consists of angular to sub-angular rock talus within soil-like rock debris.

GEOCHEMISTRY

Our geochemical program of 1965 covered the southeastern parts of the Dawson and Nisling ranges (Figure 7). The results in the "unglaciated terrain" are of particular interest. They show that the three types of mineralization (silver and/or gold, copper, and molybdenum) yield THM anomalies. However the copper anomalies from copper mineralization were very subdued (e.g. Granite Mountain) or almost absent (e.g. Revenue Creek). Moreover there were no molybdenum anomalies*.

The Granite Mountain copper prospect has copper mineralization for a length of at least 1000 feet and over a width of several hundred feet. Moreover it is well drained and should have yielded a good anomaly. However the field anomaly varied between 30 ppm and 20 ppm and extended downstream for two miles where there was a change to background values of about 5 ppm.

The original copper showing at Revenue Creek, was a 12-foot wide sulphide lens containing about 15% copper. The placer miner located it by following sulphide float which he found under the black muck on the creek bed. The silt samples from this small tributary did not yield a copper anomaly.

Consider also Burgis Creek where some molybdenite occurs in a quartz stockwork but the reconnaissance showed no molybdenum geochemical anomaly.

Lack of active oxidation probably accounts for the lack of persistent copper anomalies from large copper prospects. Although oxidized rock can be found, the present day low temperatures and the extensive permafrost inhibit current oxidation. As a result there are few copper ions available for transport by water and there is no sulphate available to reduce the pH of the waters.

Another problem arises in the type of debris in the creek beds. The lower reaches of many small creeks have a layer of black muck which covers the silt and gravel on the creek bed but which will absorb zinc ions and therefore yield a THM anomaly. In the upper reaches of the creeks the weathering is solely mechanical disintegration which yields coarse sand or grit and none of the silt and clay fractions which generally carry the desirable cations.

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*Sample digestion is more complete and more uniform in our Vancouver laboratory than in our mobile field laboratory. The better digestion will yield higher geochemical values, emphasize the best anomalies and distinguish some subtle small anomalies from background values. Our Vancouver laboratory is now re-analyzing some of our samples from the Big Creek region. The copper anomalies are improving and some small molybdenum anomalies are showing up.

In the case of molybdenum mineralization without molybdenum anomalies, the obvious answer is that the molybdenum is too sparse and unimportant to yield an anomaly. However, some of the stockwork molybdenite prospects in central British Columbia which warranted drilling did not yield stream anomalies. In these cases, the molybdenite was not physically available to the stream in sufficient quantities to yield an anomaly. There could be other extenuating circumstances in the Dawson Range. Molybdenum in stream silts is generally present as molybdenite, ferrimolybdite or adsorbed molybdenum on limonite. We know that molybdenum complexes with tannins and the resulting complex will pass through resin. One would suspect that if resins could not extract the complex from water then limonites would also not be able to adsorb them. And the waters of the Dawson Range are so laden with tannin compounds during the spring run-off that the water is brown and covered with froth.

In the evolution of geochemical exploration in British Columbia, many field geologists who originally had blind faith in geochemistry are now becoming less sure of their interpretations. They are finding that although geochemistry is an indispensable tool, it is not a panacea which will eliminate geology and prospecting and it should be used more as positive evidence of mineralization rather than as negative evidence. Moreover, 1966 saw the beginning of a change. The mad rush to cover country and find outstanding anomalies is nearly finished in British Columbia. Geologists are starting to investigate smaller anomalies and to select relatively small areas for detailed geochemical work.

CONCLUSIONS

The 1965 geochemical program in the southern Dawson Range revealed numerous THM anomalies and a few small copper anomalies. Limited follow-up work did not disclose mineralization sufficiently attractive to warrant a full-scale exploration program.

Early in 1966 we employed Mr. Colin Campbell for work in the Yukon Territory and the writer picked out several geochemical anomalies that warranted some additional work. Four of these were in the Big Creek area:

(A) Burgis Creek which had, (1) THM anomalies in silts, (2) anomalous THM, Cu, Mo, and As in soil and (3) a quartz stockwork.

(B) Mechanic Creek with a THM anomaly.

(C) Two small copper anomalies north of Big Creek which were not investigated in 1965.

Unfortunately, the lack of time, the lack of available helicopters, and the shortage of funds prevented the crew from prospecting more than the Klazan group on Burgis Creek.

In the work on Burgis Creek, Colin found molybdenite of an interesting type associated with the quartz stockwork. Petrographic work shows good sericite-kaolinite alteration in places and a favourable looking quartz—monzonite porphyry from the southeast edge of our claim group. The prospect merits a bulldozer stripping program to help outline and map the areas of interest in preparation for a possible drill program.

The Klazan prospect, if in the proven molybdenum province of central British Columbia would be a good molybdenum prospect. Geologically it is probably more similar to the Lucky Ship deposit (Morice Lake, British Columbia) which is also associated with rhyolitic volcanic or sub-volcanic rocks. Amax Exploration mapped and drilled the Lucky Ship prospect from 1963 to 1966 inclusive. According to rumour, the results have been disappointing. However, the Lucky Ship is just one of several attractive stockwork molybdenite deposits in the Tweedsmuir Park area of British Columbia. Similarly, the Burgis Creek prospect may not be the only stockwork molybdenite prospect in the Dawson Range.

One should mention Mechanic Creek, six miles southeast of Burgis Creek. A sample at the mouth of the creek yielded a THM anomaly but no molybdenum anomaly. The adjacent westerly slope of Revenue Creek has widespread disseminated pyrite with some chalcopyrite and a few quartz-molybdenite veinlets. Moreover, there is an unconfirmed report that when drilling for placer gold, a piece of molybdenite-bearing float was found on the bed of Mechanic Creek.

RECOMMENDATIONS

In conjunction with the exploration on the Klazan mineral claims, we should prospect additional good THM anomalies, small copper anomalies and subtle molybdenum anomalies. We should also prospect the outstanding gossan zones (the Klazan prospect is marked by a striking gossan zone on Burgis Creek and 80% of the good molybdenite prospects in British Columbia are marked by striking gossan zones). We should extend our geochemical coverage of the Dawson Range to the northwest and we should also do some geochemical work and prospecting around the porphyry intrusions near the Ladue River.

The helicopter needed for the follow-up work and the reconnaissance work could support the stripping and possible drilling program on the Klazan claim group and the bulldozer for the Klazan work could be used to strip other anomalies along Big Creek. Although most of the work would be done out of a main camp on the Klazan Group (Burgis Creek), we would need another one or two base-camps along the Yukon River. These would be supplied by a float plane out of Dawson City. The helicopter fuel might be transported down the Yukon River from Minto.

The crew tentatively recommended to look after this program and also the drill program on Cub Creek is as follows:

1 geologist (temporary or permanent)

1 student geologist

1 prospector

6 student assistants for silt sampling, etc.

helicopter pilot and engineer

DAWSON RANGE BUDGET

Geologist in charge	$	3,000
Summer help		15,500
Food		8,500
Camp supplies		1,500
Camp equipment		1,500
Radio rental, phone		700
Geochemistry and assays		4,000
Claim costs		5,000
Haulage		2,500
Transportation (rent one vehicle)		2,000
Travel and accommodation		2,500
Helicopter ($9,000 per mo. for Bell 47 Super G, with gas)		36,000
Plane charters		3,500
Bulldozer		5,000
Air photos, office supplies		500
Contingencies		2,800
	$	94,500

ALTERNATIVE "BIG CREEK PROJECT"

EXPLANATION

I am confident that, although the Klazan stockwork prospect lacks some desirable geological features, it has enough favourable features that we must do additional work. (Stockwork molybdenite prospects that warrant exploration are infrequently discovered in western Canada). Moreover, parts of the Big Creek drainage basin for 15 miles of length should also be investigated with additional geochemical follow-up work and bulldozer stripping. Time spent investigating anomalies in this region, without the use of a bulldozer, will be largely wasted.

The directors for Coranex Limited will probably be divided in their opinion on the merits of the Dawson Range for further reconnaissance geochemical work. Some may prefer to wait until a company proves that the Dawson Range is favourable for large copper or molybdenum deposits. However, any additional reconnaissance silt sampling by Coranex Limited must be done either in the Dawson Range or in the Cariboo. We cannot start work in any additional areas unless we employ an experienced field geologist. And the Dawson Range is geochemically virgin prospecting country whereas the Cariboo was the object of numerous geochemical programs in 1966.

(maybe Cariboo better bet)

The total budget proposed for the Klazan stripping program, the Big Creek follow-up, and the Dawson Range reconnaissance amounts to $123,000. We could consider an alternative "Big Creek Project" for follow-up work in and adjacent to the Big Creek valley and for prospecting any gossan zones in the Dawson Range. The Big Creek project could be a 2-month helicopter-supported bulldozer-stripping program, or a 4-month program supported by a Nodwell track vehicle, or a 4-month program using a helicopter from Whitehorse when needed. This last possibility may not be satisfactory because helicopters are not readily available for casual work and because the ferrying charges between Whitehorse and Carmacks are about $500.

The crew needed for the Big Creek program (supported by Nodwell) and for the Cub Creek drilling would be as follows:

Geologist -- Colin Campbell

2 temporary graduate geologists

1 prospector

1 cook

5 student assistants

1 Nodwell driver

BIG CREEK BUDGET

Purchase of Nodwell	$13,500
Nodwell driver	2,500
Temporary wages	18,000
Food	8,000
Travel and accommodation	3,500
Camp supplies	2,000
Camp equipment	2,000
Radio rent and phone	1,000
Haulage	2,000
Transportation	3,000
Geochemistry and assays	4,000
Bulldozer	10,000
Plane charters	1,000
Helicopter	8,000
Claim costs	5,000
Miscellaneous	2,500
	$86,000

PROPERTY EXAMINATIONS

In the 1966 season, when convenient, we visited some prospects in the regions where we had reconnaissance programs. These included properties available for option and properties under investigation by other companies. Reports were submitted for some of the properties (marked by asterisk) and notes are on file for the remainder of the properties. The properties and the examining geologist are as follows:

J. R. Woodcock:

*Clearwater molybdenum	May 22
*Clarey Lake molybdenum prospect near Alice Arm (Mastodon-Highland Bell)	June 23
*Roundy Creek molybdenum near Alice Arm (Silurean Chieftain)	June 24
Homeguard prospect near Alice Arm	June 26
*Watson Bar mercury prospect	July 21
*Molybdenum Creek near Terrace	August 12
*Kleanza Copper Mines near Terrace	August 13

J. R. Woodcock and R. H. Janes

Andy claims, Quesnel River	June 12
Cariboo Bell	July 28, October 5
Boss Mountain	September 27

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CARIBOO AREA

Campbell, R. B., 1961, Geology Quesnel Lake (W½), British Columbia; Geological Survey of Canada, Map 3-1961.

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