

Recommended
Exploration Program

Marc Claim Group

June 11, 1966

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RECOMMENDED

EXPLORATION PROGRAM

MARC CLAIM GROUP

SILVER CITY MINES LTD.

UPPER WHITE RIVER DISTRICT

YUKON

June 11, 1966

INTRODUCTION

The purpose of this report is to comment briefly on the mineral potential of the Marc Group of claims and to propose an exploration program for them. The geology and geomorphology of the surrounding district will not be discussed in detail.

Information for this report has been obtained from G.S.C. Memoir 50 by D.D. Cairns (1915), "Upper White River District, Yukon", and U.S.G.S. Bulletin 894 (1938), "Geology of the Chitina Valley and Adjacent Area, Alaska". The author is not personally familiar with the district and has not visited the property.

PROPERTY AND LOCATION

The Marc group consists of 144 contiguous mineral claims, as shown on the accompanying map, which is copied from the current claim sheet for this area. The group surrounds six older claims, Goldenhorn 1-4 and Slaggard 1-2, as well as the Lost Treasure Crown granted claim. The group lies between the junction of the White River and the Klutlan (Generc) River, in the Upper White River district of the Yukon Territory, about 15 miles south of the Alaska Highway.

The ownership and exact location of the claims are not pertinent in this report.

GENERAL GEOLOGY

The Upper White River district lies along the northern edge of the St. Elias Mountains. Topography is characterized by wide, deeply incised, U-shaped glacial valleys. The valley floors are obscured by a varying thickness of glacial till,

volcanic ash, muskeg and peat. The upper parts of the valley floors are poorly drained containing numerous small lakes, swamps and muskegs.

The oldest rocks in the district are micaceous schists and quartzites belonging to the Yukon group, of Precambrian or early Palaeozoic age. Overlying the Yukon Group is a series of limestone, chert and shale of Carboniferous age, which is conformably overlain, in turn, by a sequence of shale, sandstone, conglomerate and limestone that has been extensively invaded by andesite, diabase, basalt and related pyroclastics. The volcanics and sediments were apparently laid down intermittently from Carboniferous to early Cretaceous time. These older rocks were intruded by Mesozoic granitic stocks undoubtedly related to the Coast Range batholith.

About Eocene time vulcanism again became active and the older rocks were invaded by rhyolites, latites and related rocks. Flow rocks and fragmental material accumulated to thicknesses of several thousand feet in places.

GEOLOGY OF THE CLAIM AREA

Most of the claim group is situated on a broad low divide lying just south of the junction and between the White and Klutlan Rivers. The divide is poorly drained and is covered by a varying thickness of glacial till, volcanic ash, peat and muskeg. Outcrop is not abundant and is best seen where the White River and its tributary, Boulder Creek, have cut a narrow post-glacial canyon through the overlying till into bedrock, some four miles upstream.

from the junction with the Klutlan River.

Cairns mapped four small outcrops of the Carboniferous limestone, shale and chert series which all lie on the claim group. The limestone series is overlain by the older volcanic series which forms most of the outcrop in the area.

Presumably, all the overlying recent volcanics have been eroded away by glacial action.

Very little information is available on folding, faulting, and attitudes of beds. Cairns described the shale and chert in the limestone member as being altered, crushed, and distorted, possibly due to folding. No mention is made of major faulting in the immediate area of the claims.

MINERALIZATION

1. GENERAL-

Other than placer gold the most important metal in the Upper White River district is copper. The minerals most commonly found are chalcocite, bornite and chalcopyrite. These minerals, the chalcocite in particular, are usually highly oxidized near surface. Native copper is abundant in the soils and gravels of the area and presumably results from the oxidation of chalcocite.

Copper mineralization is most commonly found in the older volcanics and usually occurs associated with amygdaloidal flows. The copper mineralization occurs as amygdules in the vesicular lava, associated with zeolites and calcite, and as small veinlets.

Copper bearing calcite veinlets have also been noted in the volcanic rocks near limestone contacts and in the limestone

itself near diorite contacts.

The extremely rich ore at the Kennecott Mine, 60 miles southwest, was found entirely in limestone, just above a sequence of basaltic lava flows, and was not obviously related to the nearby intrusives.

2. CLAIM AREA-

A copper prospect (Discovery Copper Grant) on the Goldenhorne claims was described by Cairns in Memoir 50. The approximate location of this showing is plotted on the map. The copper occurs in a finely textured amygdaloid that, locally at least, is cut by numerous small fractures. These fractures contain native copper that, presumably, was produced by the oxidation of chalcocite. The volcanics also contain numerous veinlets with chalcocite, cuprite, native copper and chalcopyrite. Cairns commented that the prospect warranted further development and that better prospects might be found in the area beneath the extensive till cover. No assays are given in Cairns report, probably because of the difficulty of obtaining a representative sample from this type of deposit.

No other showings are described in the claim area by Cairns.

SUMMARY AND CONCLUSIONS

The White River area will be difficult to explore although the possibility of finding a large copper deposit in an open pit mining situation makes an initial exploration program worthwhile. Two types of deposits might be present- a large low-grade deposit consisting of veinlets and amygdules in volcanic flows, or a contact metasomatic deposit associated

with skarn zones along limestone contacts.

Although the property is close to the Alaska Highway, it is almost inaccessible by ground during the summer. Exploration this year will have to be done with tools that can be moved to the property by helicopter. The possibility of landing float planes on the small lake on the Marc 75 and 78 claims should be checked. A discussion of various exploration techniques that might be used are as follows:

1. Geological Mapping- The area was undoubtedly very well prospected at the turn of the century and further prospecting is unlikely to turn up undiscovered mineralized outcrop.

However, in order to plan a drilling or geophysical program more information is required than is available in the literature. The altitude of the volcanics and limestone, the degree of dissemination of mineralization in both the country rocks and the areas with ore mineralization and, if possible, the depth of oxidation should be determined. Only one copper showing is described in the literature but others may exist.

2. Geochemistry- Because of the gentle relief, glacial overburden, volcanic ash and the probability of transported native copper in the overburden, geochemical sampling is unlikely to be useful.

3. Geophysics- A magnetometer survey will not be effective because the copper minerals are not associated with magnetic

minerals. Also, since magnetite is known to be present as an accessory mineral in the volcanic flows, a magnetometer survey would only define the location of the flows.

It is possible that the geological investigation will show that the favourable amygdoloidal basalt contains more magnetite than the other volcanic horizons. If this is the case magnetic surveys might define the favourable horizon. Testing the magnetic susceptibility of the various volcanic horizons will therefore be an essential part of the mapping program.

EM methods are generally unable to detect disseminated mineralization. If the shear zones containing native copper are found to be continuous and well mineralized, the mineralized shears might be located by EM techniques.

I.P. surveys are usually used to locate disseminated mineralization. However, under the best of circumstances I.P. is difficult to interpret and to be really effective, the exact degree of mineral dissemination in the country rock, ore deposits and overburden must be known.

A commonly used rule of thumb in I.P. work is that 2% sulfides are a minimum requirement for detection. However, as already mentioned the most important factor is the degree of dissemination. As I.P. is a very expensive tool it is rarely used for reconnaissance. Average costs, not including camp and transportation costs would approach \$500.00 a line mile, or at 400 foot line spacing, about \$500.00 per claim. At present there is not sufficient geological evidence available

to determine whether the method is applicable for the Marc mineral claim area.

A one week I.P. test would cost about \$5000.00 for equipment rental, interpretation, camp and transportation. EM could be tried at the same time for very little additional cost. I.P. is very difficult to operate in winter and since parts of the area are impassible in summer they could only be surveyed in spring. EM could be done as easily in winter as in summer except in periods of severe cold weather. For I.P. or EM surveys, well cut grid lines would be necessary.

4. Drilling- If prospecting locates mineralization on the Marc Claims, a small initial drilling program should be considered prior to commencing geophysical surveys. This would provide the necessary information on character of mineralization, degree of dissemination and depth of oxidation on which to make the geophysical decisions.

The cheapest way of drilling the area, particularly where covered by overburden, would be with a rotary percussion overburden drill. The best machine available in the Yukon is the Nodwell mounted Mayhew 1000 rotary drill operated by United Geophysical Ltd. This drill can cope with overburden depths up to 300 feet and can penetrate bedrock a further 700 to 1200 feet. Drilling is done either dry or wet depending on the ground water content. Recoveries are good but probably not as good as with diamond drilling. This machine is best used on a reconnaissance basis to determine where the best mineralization occurs, following which these areas can be further

explored by diamond drilling. On a fairly large program, costs of the Mayhew 1000 drill will be about \$7.00 per foot.

In summary, there is no obvious easy approach to initial exploration of this type of deposit under the existing conditions. Detailed geological mapping and perhaps several drill holes are the logical first step. After the information from this stage of the program is compiled, a geophysicist should be retained to study the results to decide if an effective geophysical method is available.

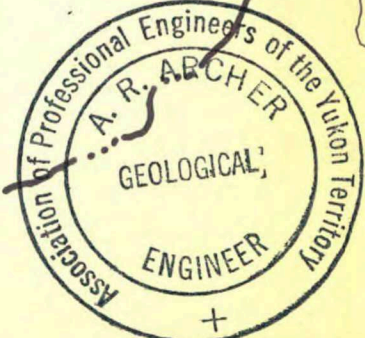
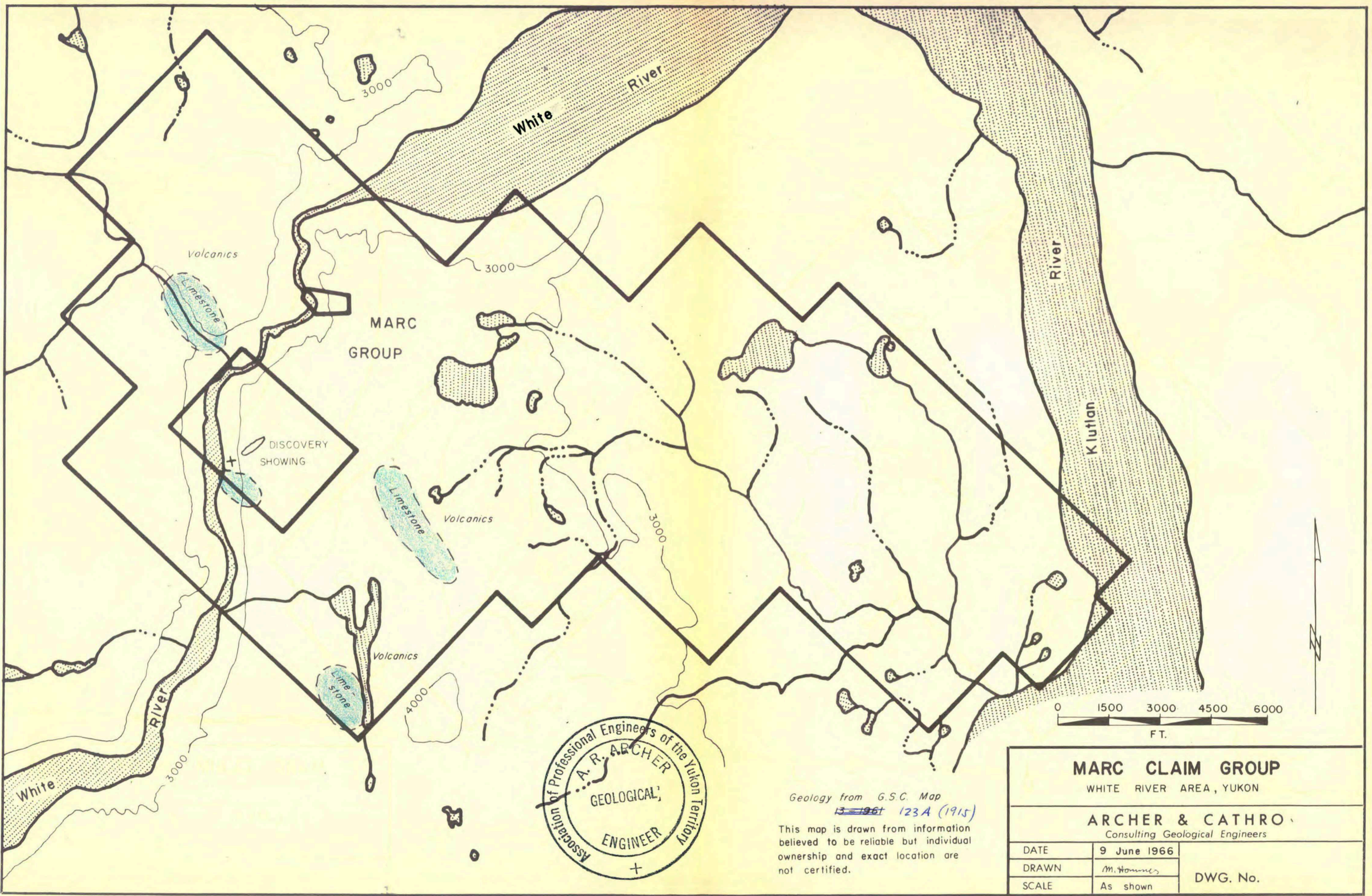
Because of the difficulty of moving on the ground in the area, an overburden drill could only be used after freeze-up.

RECOMMENDED EXPLORATION PROGRAM

1. Do geological mapping on all outcrops and detailed mapping and sampling on any mineralized showings. This would be best done in July.
2. Move an X-ray diamond drill onto property by helicopter or float plane to drill several short holes into mineralized showings located by geological mapping. This work should be planned for late August and September.
3. In September have a geophysicist review all information and make recommendations. At this time several geophysical methods might be tried on an experimental basis.
4. If diamond drilling indicates that the favourable horizon might be followed by reconnaissance drilling at 500 or 1000 foot intervals, move the Mayhew 1000 rotary drill in after freeze-up and drill during the winter.

Respectfully submitted,

A. D. G. / -



Geology from G.S.C. Map
~~13-1961~~ 123A (1915)
 This map is drawn from information believed to be reliable but individual ownership and exact location are not certified.

MARC CLAIM GROUP		DWG. No.
WHITE RIVER AREA, YUKON		
ARCHER & CATHRO		
Consulting Geological Engineers		
DATE	9 June 1966	
DRAWN	M. Holmes	
SCALE	As shown	