

**CANADA**  
**DEPARTMENT OF MINES**

HON. T. A. CRERAR, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER

**BUREAU OF ECONOMIC GEOLOGY**  
**GEOLOGICAL SURVEY**

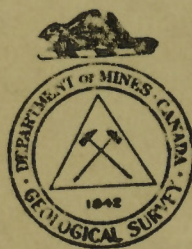
**PRELIMINARY REPORT**

**PROSPECTING POSSIBILITIES**  
**OF TESLIN-QUIET LAKE-**  
**BIG SALMON AREA, YUKON**

BY

H. S. Bostock

Paper 36-2



**OTTAWA**  
**1936**

CANADA  
DEPARTMENT OF MINES  
BUREAU OF ECONOMIC GEOLOGY  
GEOLOGICAL SURVEY

PROSPECTING POSSIBILITIES OF TESLIN - QUIET LAKE - BIG SALMON AREA,  
YUKON

BY  
H.S. BOSTOCK

PAPER 36-2

1936

Prospecting Possibilities of Teslin-Quiet Lake-  
Big Salmon Area, Yukon

By H.S. Bostock

The Teslin-Quiet lake-Big Salmon area shown on the map accompanying this paper is part of southeastern Yukon and commercially tributary to Whitehorse. The southern part is connected to Whitehorse by direct water route, via Lewes and Teslin rivers which are navigable for steamers though no regular service runs on Teslin river. Big Salmon valley and the country north of it are reached from Big Salmon river, a rapid stream. The main stream can be ascended by poling boats or suitable small power boats in August when the stage of water is best. Many canoes and small boats descend it from Quiet lake. Livingstone creek is reached by wagon road from Mason Landing on Teslin river. Quiet lake and the east side of the area are reached by ascending Nisutlin river from Teslin lake in small power boats. A fairly level 4-mile portage connects Nisutlin river and Quiet lake. The area contains few trails but horses may be taken to any part of it though travelling is slow. Trees suitable for cabins and mine timber grow in the valleys except where the elevation is more than 4,000 feet. Airplanes from Carcross or Whitehorse can reach lakes in the southern part of the area in about an hour's flight.

The north and east parts of the area are mountainous and contain peaks as high as 7,000 feet. A marked valley borders the mountains and separates them from a lower, hilly country on the west. The valley extends from the upper part of Swift creek northwestward along Baker lake, Loon lakes, South Fork river, and Big Salmon river. It will be referred to in this paper as "the valley".

## Geology

The area contains three main groups of rocks, an old metamorphic group, a Mesozoic sedimentary and volcanic group, and a group of intrusive rocks varying widely in composition and to some extent in age.

The metamorphic group forms the greater part of the mountains and the Mesozoic group the lower hills southwest of the valley. Only in a few places do the rocks of these groups extend across the valley. The intrusive rocks occur mainly in the mountains, but also outcrop in some small areas southwest of the valley.

In addition to the three main groups some small areas of Tertiary volcanics occur in the mountains north of North Fork river and near the mouth of Boswell river. They are composed of basalt, andesite, and dacite lavas and there is small prospect of minerals being associated with them.

The metamorphic group contains a variety of rock types. They are largely of sedimentary origin, but include some of volcanic and intrusive origin. The chief sedimentary types are quartzite, quartz, mica, and chlorite schists, grey and black slates and argillites, and limestone. The volcanic rocks are green chlorite and hornblende schist and greenstones. The intrusives are dykes of sheared granitic rocks. In places the rocks of this group have been intensely metamorphosed to gneiss. On the east side of Quiet lake and south of Boswell river considerable areas of little metamorphosed volcanics are included in this group. Veins were noted in the rocks of the group in many localities and areas underlain by these rocks are in general good prospecting ground.

The Mesozoic group includes beds of limestone and argillite at the base, conglomerates, argillite, and some volcanics in the middle part, and andesite lava and tuff in the upper part. Little sign of mineral has been found in these rocks and they are not regarded as good prospecting ground.

The intrusives include serpentine and peridotite, quartz diorite, diorite and gabbro, and granitic types. The serpentine and peridotite are closely associated. They have been metamorphosed and are the oldest of the intrusives. They occur north of Big Salmon river, in the mountains east of South Fork river, in the hills west of Teslin river, and in a number of small bodies near the granite in the upper parts of Boswell River and Sydney Creek valleys. The quartz diorite and related types form stocks in the mountains east of Teslin river and south of Boswell river. Mineralized veins were noted in many places near these stocks and the country round them is particularly promising for prospecting. The granitic types, the youngest intrusives, include granodiorite, granite, pegmatite, and porphyry. They form batholiths and stocks in the mountains and smaller stocks in the hills southwest of Teslin river, as well as smaller bodies and dykes. The areas near their contacts are favourable for prospecting.

#### Placer Prospecting

Placer gold has been known in this area since 1881 when one of the first prospecting parties in Yukon ascended Big Salmon river and discovered gold in its bars. The most important discovery was in 1898 when gold was found in Livingstone creek and other neighbouring creeks. This camp



is reported to have produced over \$1,000,000 in gold, most of which came from Livingstone creek. Iron creek, discovered in 1905, has also attracted much attention. Gold has also been found on a large number of other creeks, but the yield has been small.

Most of the gold-bearing creeks have certain characteristics in common. With the exception of Geary creek, they occur in the parts of the area underlain by the metamorphic and intrusive rocks. In the bedrock of a number of the valleys quartz veins are conspicuous and numerous. The more important creeks have deposits of pre-Glacial gravels containing only local rocks. The best pay has been found at the base of these old gravels or in streams that have cut through these old gravels. The old gravels are overlain by glacial boulder clay and by recent gravel deposits which contain foreign rocks and rarely carry good gold values. The old gravels occur in valley bottoms that escaped scour during glaciation. As the main ice movement was northwesterly down Teslin, South Fork, and Big Salmon valleys, and valley glaciers formed most commonly on the northeast sides of the higher mountains, the valleys most apt to have escaped scour are the tributaries to the main valleys which run west and southwest, rarely east, and which have prominent spurs on their south sides to protect them. Iron creek runs south and the preservation of old gravels in its valley is believed due to the ice movement having been impeded by the mountains north and northwest of it. If this be true, old gravels are likely to occur in neighbouring valleys regardless of their direction. Large quantities of ice are believed to have moved down the valleys of Teraktu creek, the head of South Fork river, and Boswell river, and to have scoured the valleys extensively.

The creeks with the features outlined above that offer most promise of holding profitable placers are those running into North Fork river from the east, those entering the valley on the west of the mountains between Big Salmon and the southeast corner of the area, those tributary to Boswell river and Sydney creek, and those entering the valley of Quiet lake and the upper part of Big Salmon river. Valleys of these creeks commonly contain large accumulations of drift and the creeks in many cases occupy post-glacial channels. As a general rule, though not always, the old channels in valleys that extend approximately east and west lie south of the present courses.

#### Lode Prospecting

There has been no lode production from the area, though a little lode prospecting has been done since the discovery of Livingstone placer camp. From time to time quartz veins said to carry gold have been staked near Livingstone creek, but little work has been done on them.

Some copper-gold showings near Loon lake were staked in or before 1900, but the only development work done on them consists of two adits and a number of open-cuts. The assay values from these workings are not known with certainty, but samples are said to have carried copper, and gold up to one-half ounce a ton. On the north side of Boswell river, 15 and 20 to 24 miles from Teslin river, steeply dipping fissure veins carrying silver and lead have been staked.

At the 15-mile locality the veins contain galena in a quartz gangue, and lie in the metamorphic rocks  $1\frac{1}{2}$  miles from the granite and close to a large quartz porphyry dyke. The veins have been exposed in trenches and a short tunnel.

Twenty to 24 miles from Teslin river several large veins up to 30 feet wide cut the metamorphic rocks near the granite. These veins contain galena, pyrite, and quartz. Selected specimens are reported to run as high as 400 ounces a ton in silver. The workings are open-cuts and a tunnel 120 feet long. Similar silver-lead veins are reported to occur in the mountains on the south side of Boswell river. Quartz veins carrying pyrite and galena have been staked near the head of Johnson creek 7 miles from Teslin river. Mineral showings carrying copper and silver values have been found east of Rosy lake.

The prospects mentioned include practically all the property staked in the area, so that most of it is virgin ground although it is one of the most accessible parts of Yukon.

The areas of both metamorphic and intrusive rocks are considered favourable for prospecting, but the interiors of the large granite areas are not as promising as the country bordering the intrusives. The area from Mendocina creek southward is regarded as preferable to that farther north on account of its greater accessibility, and of this, the parts near the quartz diorite stocks are believed to be the best.

Ottawa, January 13, 1936.

HSB/LN