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ADVANCE REPORT
BUTEUX AREA
ABITIBI COUNTY AND ABITIBI TERRITORY

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF MINES

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BUREAU OF MINES

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BUTEUX AREA

ABITIBI COUNTY AND ABITIBI TERRITORY

by

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QUEBEC

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P.R. No.142

BUTEUX MAP AREA
ABITIBI COUNTY AND ABITIBI TERRITORY

by B.C. Freeman

INTRODUCTION

The discovery of bodies of massive sulphides carrying small values in gold, and the finding also of free gold in a quartz vein, has directed attention to the Buteux Area, Abitibi. Since part of the area was unmapped and the remainder was known only from reconnaissance explorations, the writer was instructed to make a geological survey of the area and to investigate the mineral occurrences. This work was done during the summer of 1939.

Location and Access

The area is in the extreme south part of Abitibi Territory and the north part of Abitibi county. Longitude 75°00' passes a short distance within its eastern boundary, and latitude 49°00' is a little more than six miles north of the southern boundary. The area lies about 60 miles directly north of Oskelaneo and 100 miles northeasterly from Senneterre, both stations on the Canadian National railway. Aeroplane service is available at these towns.

The most convenient route to the area is by water from Rouleau Siding, at mileage 70 west of Oskelaneo, at which point the Kekek river crosses the railway.

The Kekek joins the Mégiscane river 15 miles, air-line distance, north of the railway track. From the mouth of the Kekek, the central and eastern part of the area may be reached by ascending the Mégiscane and Pascagama rivers, and the western part by descending the Mégiscane and ascending the St. Cyr river to Lac Bailly, from which a portage of a mile and a half leads to a pond draining into Lac Lacroix and the Eagle river. If an outboard motor is used, the trip from Rouleau Siding can be made in two to three days, but it may take a week if heavy loads are carried, requiring several trips across the portages.

From the Chibougamau region on the north, the area can be reached by ascending the rivers that drain into Lac Doda or into Surprise lake.

Topography and Drainage

The area embraces the drainage divides between several north-flowing streams and the Pascagama river. Swamps, such as are

characteristic of much of the height-of-land country, are extensive, but the flat topography is relieved by a number of rather prominent hills, especially in the central part of Buteux township and in the east-central part of the map-area. Small lakes and ponds are numerous, drained by narrow, crooked streams whose courses are interrupted frequently by boulder rapids. Lac Lacroix is the only large lake in the area and the Eagle river, which drains it to the north, is the only large stream.

Almost the entire area is covered by green timber, only a small section in the southeast having suffered from forest fires. In the hilly, central part there are some fine stands of spruce and pine.

GENERAL GEOLOGY

The entire area is underlain by rocks of Precambrian age. Broadly stated, a belt of greenstones and associated Keewatin rocks, about ten miles wide and trending approximately east-west, extends across the central part of the area and is bordered on the north and south by intrusive granitic rocks. The greenstone belt continues beyond the map-area, both to east and west. The similarity between the rocks in this and adjoining areas is so striking that there is no doubt that the greenstone are part of the Keewatin volcanic complex that has been mapped in various parts of the Chibougamau and Waswanipi regions.

The following table lists the formations recognized:

Table of Formations

Pleistocene and Recent	Boulder clay, sand and gravel
Unconformity	
Late Precambrian	Gabbro. In part may be older than the granitic series
Intrusive contact	
Post-Keewatin	Undifferentiated grey and red gneisses, pegmatite. Garnetiferous and non-garnetiferous schists. Red granite and granite gneiss. Grey granite gneiss
Intrusive contact	
Keewatin	Tuffaceous greywacke, slate Volcanic rocks, acid to basic flows; pyroclastics; intrusive bodies

Keewatin

The Keewatin rocks are of three main types: lavas, tuffaceous greywacke, and slate. The three types are intimately associated and apparently grade into one another.

Lavas:

The south portion, and in places almost the entire width, of the Keewatin belt consist, in the main at least, of volcanic rocks. The flows are mainly of the fine grained, andesitic type so common as the chief constituent of greenstone belts. They are green in colour due to the presence of chlorite. On Lac Narcisse there are exposures of very fresh appearing, coarse grained, dark grey pillow lava of dioritic composition, but such occurrences are exceptional. At various places, rhyolite flows, and also beds of tuff and siliceous slate, are interbedded with the andesite. A band of such rocks in the central part of Buteux township extends from Claim lake westward for over two miles, to and beyond Schist lake.

Greywacke:

The north portion of the Keewatin belt is a band, averaging about one mile in width, of rocks classed as greywacke. These are fine grained, dark to light grey rocks, consisting chiefly of feldspar, biotite, and quartz, in varying proportions. The biotite-rich, quartz-poor types are schistose and not well banded. The quartz rich, light coloured types are usually finely banded and form smooth, massive outcrops.

Slates:

The slates are finely banded, very fine grained, tough, hard, rocks. They vary in colour from place to place, from very light grey to nearly black, but in most outcrops are fairly light grey. Individual bands show a range in thickness from a hair-line to one-tenth of an inch. Most of the slates are siliceous and may be related to the siliceous iron-poor bands in iron formation. In one place, about half a mile northwest of mile 17 on the E.-W. surveyed line, there are exposures of a very dark slate containing a considerable amount of carbonaceous material, some at least of which is graphite.

The slates occur in a short, wide band, about 9 miles by 3 miles, lying between greywackes on the north and lavas on the south. This band is mostly in the southern part of township 120, but it extends a short distance eastward into township 121.

Intrusive Rocks

The intrusive rocks of the area are mainly granitic or dioritic in composition and gneissic in structure. They will be

grouped for description under the following heads: (1) southeastern gneiss, (2) grey gneiss, (3) red granite, (4) gabbro.

Southeastern Gneiss:

The intrusive rocks in the western and central parts of the area grade eastward into, or are cut off by, a complex of granite, schist, and gneiss which may be traced beyond the limits of the present map-area into the southeastern part of the Chibougamau map-sheet (1). This complex consists of grey and red gneiss cut by numerous pegmatite dykes, some granular red granite, and shreds of schistose rocks, some of which contain abundant garnet. These rocks have a northeasterly strike, in contrast to the general east-west trend of the rocks elsewhere in the area.

Grey Gneiss: Grey gneiss is the most abundant rock type in the map-area.

Usually, these rocks consist of quartz, grey feldspar, and biotite. Some contain hornblende, either instead of, or in addition to, biotite, and in some there is a small amount of red feldspar, usually in larger grains than the other minerals. The grain size varies from fine ($\frac{1}{2}$ mm.) to coarse ($\frac{1}{2}$ cm.). The banding is pronounced and easily seen in some types but is very faint in others, particularly where the rock is dark and fine grained.

Red Granite:

The red granite occurs principally along and adjacent to the north margin of the Keewatin belt and cuts both the grey gneiss and the greywacke of the belt. It is a biotite granite containing pink feldspar. Typically, the rock is massive and coarse grained but in some exposures it has a faintly gneissic structure. Many fine grained dykes of this rock cut the grey gneiss. Along the south shore of the northeast arm of the crooked lake in Township 121, there are large masses of red pegmatite.

Gabbro:

Gabbro of two different types, and probably of two ages, occurs within the map-area: one is a fairly light grey, olivine-free rock, the other is dark brownish-grey and olivine-bearing.

The olivine-gabbro occurs as stocks in the south-central part of Marceau township, in the area occupied by the 'southeastern' gneiss. It has a very fresh, unaltered appearance on unweathered surfaces. Although actual contacts of gabbro and gneiss were not seen, the fresh character and massive structure of the former indicate that it must be younger than the gneiss.

The olivine-free gabbro occurs as stocks and sill-like bodies within the Keewatin belt in the south-central part of Township 121 and the north-central part of Marceau township. It may

(1) Chibougamau Sheet, Geol. Surv. Can., Map 397 A.

possibly be older than the granites and gneisses, but actual contacts with these rocks were not seen. Sparsity of outcrop makes it impossible to map its distribution accurately. The rock consists of dark plagioclase feldspar, black pyroxene, and a little biotite. It has textures in places resembling those of the Chibougamau anorthosite and the Bell River complex.

There are many small diabase or basalt dykes in various parts of the area. These are of fine grained, black-fresh-appearing rock.

STRUCTURE

The structure of the area is known only in broad outline, since the rocks are so poorly exposed that even such prominent features as contacts can be shown only in approximate position. The volcanics and sediments form a closely folded syncline between the intrusive rocks on the north and south of them. The strike of bedding and shearing varies between fairly wide limits, but the general trend is approximately east-west. Dips are almost all high, and most of them are nearly vertical. Drag-folding is well shown in the banded rocks, and along some of these folds a large amount of thickening and thinning of the beds is indicated. Much of the rock is strongly sheared and rendered schistose or gneissic.

Fracturing and faulting are not very marked. Apparently the greatest amount of fracturing occurred in the relatively brittle bands of acidic rocks contained within the lavas.

ECONOMIC GEOLOGY

Gold is the only metal that has been searched for or found within the area. There has been considerable staking, particularly in Buteux township, but none of the prospects have been developed. Five prospects were visited in the course of the summer's work and a short description of each follows.

Seguin-Griffith Claims

(Little Eagle River, Buteux Township)

At this property (No. 1 on the accompanying map), some work has been done on three claims (A-83749, 83750, and 83755) which lie on either side of the Little Eagle river. On these claims there are a number of outcrops of grey, gneissic diorite, belonging to the south band of 'grey gneiss'. The rock is somewhat altered, the feldspar particularly having been converted to opaque, greenish material. The gneissic structure is not strongly developed. It has a variable, but in general nearly east-west, strike, and the dip ranges from 10° to vertical. The rock is severely jointed, in places sheared, and is cut by a number of diabase and aplite dykes. Some of

the zones of fracturing and shearing have been silicified and otherwise mineralized and are occupied by quartz veins. As a whole, the veins seen are short and narrow; more stripping is necessary to prove their true extent. Some can be seen to be quite short, and none have been exposed for more than fifty feet along the strike. They strike in various directions and all have a high dip.

One of the more important veins outcrops about 100 feet south of the Little Eagle River, on claim 83755. It strikes east-west and has a maximum width of one foot along its exposed length of 30 feet. At its western end, where it abuts against a northerly trending diabase dyke, free gold in easily visible specks occurs along fractures in the dark grey quartz.

Five hundred feet northeast of the river, on claim 83749, a silicified shear-zone crosses a small outcrops of the diorite. The zone strikes N.70°E. and dips at 60° to the northwest. Its exposed length is 45 feet, beyond which, both to east and west, it is concealed beneath overburden. The strongly silicified zone is five feet wide, but there is less pronounced silicification over a greater width. A channel sample taken across the 5-foot zone is reported to have assayed \$2.80 in gold per ton.

Golden Eagle Syndicate

(Buteux Township)

This property (No.2 on the accompanying map) is one mile west of the centre point of the township, and about three miles east of the Seguin-Griffith claims, described above. It is situated within the Keewatin belt, near its south margin, and is underlain by light coloured, sheared tuffs, which strike N.20°E. and dip at 60° to the southeast. Cutting the tuffs are two parallel diabase dykes, about two feet wide and one foot apart, and the tuff beds between them are strongly sheared. Quartz, calcite, and pyrite have been introduced along the shear and also, in small amount, in the adjacent dykes. It is reported that grab samples of the shear material have given low assays in gold.

Radio Prospectors, Limited

(Butoux Township)

This property (No.3 on the accompanying map) is about two miles northeast of the centre point of the township and just west of Claim lake. From the lake, a valley, some 500 feet wide, extends westward. The rock along its north side is strongly sheared pillow andesite. Bounding the valley on the south is a steep wall of massive andesite, with quartzitic slates and acidic tuffs on its north, or valley, side. The slates and tuffs strike N.85°-90°E. and dip vertically or high to the south. They are severely drag-folded,

and in places within the curves of the folds the rock has been replaced by massive sulphides, which have the form of lenticular bodies up to 27 feet long and 9 feet wide. Some of these bodies consist mainly of pyrite; others are chiefly pyrrhotite. Several such lenses were discovered by trenching, but the workings are now largely filled-in by caving, making examination of the deposits difficult. Two representative samples taken from veins or lenses on the property by W.N. Asbury in 1937, and assayed in the laboratory of the Bureau of Mines, gave 'trace' and 'nil', respectively, in gold (1).

Griffith Claims

(Butoux Township)

The Griffith claims (No. 4 on the accompanying map) are about half a mile west of the centre point of the township. Exposures on the property are limited to an area having a diameter of about 300 feet. The rock outcropping on the property is for the most part amphibolite which exhibits faint traces of pillow structure and thus is an altered basic lava. Interbedded with the amphibolite are three or four bands of quartz-mica schist, representing altered sedimentary beds. The rocks are severely sheared and drag-folded, with general strike N.30°-45°E. and dip ranging from 50° southeast to vertical. Silicified zones occur in several places in the area of exposed rocks.

Very little stripping has been done. Much of it has been on a silicified zone in altered sediments which contain abundant garnet. One white quartz vein is exposed for a length of about fifty feet. It swells and pinches along its course and at two points it splits into two veins, which merge again into one. The best showing is a gold-bearing quartz lens in the amphibolite, in which it appears to follow a drag-fold. It is exposed for a length of about 15 feet and a width of 5 feet. With the quartz are appreciable amounts of carbonate and pyrite, and gold can be panned from the crushed material. A one-pound sample taken by the writer and assayed in the laboratory of the Bureau of Mines gave \$11.79 in gold per ton.

Golden Eagle Syndicate

(Lacroix Township)

On this property (No.5 on the accompanying map), a trench has been opened across a small point that juts out from the north-west shore of Lac Chanceux, a small lake in the north-central part of the township. The trench is slightly over 100 feet long and cuts across the strike of the formations. Most of the rock exposed in it

(1) Que. Bur. Mines, P.R. No. 120, 1937, p. 20.

is well bedded tuff, striking N.65°W. and dipping vertically, but about midway along its length is a carbonatized zone, 10 feet wide, and near its south end the tuff is cut by a quartz vein, 3 feet wide. At the northern end of the trench, on the lake shore, there is a 20-foot wide outcrop of white, crinkled, talcose schist, and similar rock is exposed at the south end. The rock outcropping on the lake shore about 30 feet south of the end of the trench is andesite containing a large amount of disseminated pyrite. Assays of samples from the showings on this property are reported to have yielded negligible values in gold.

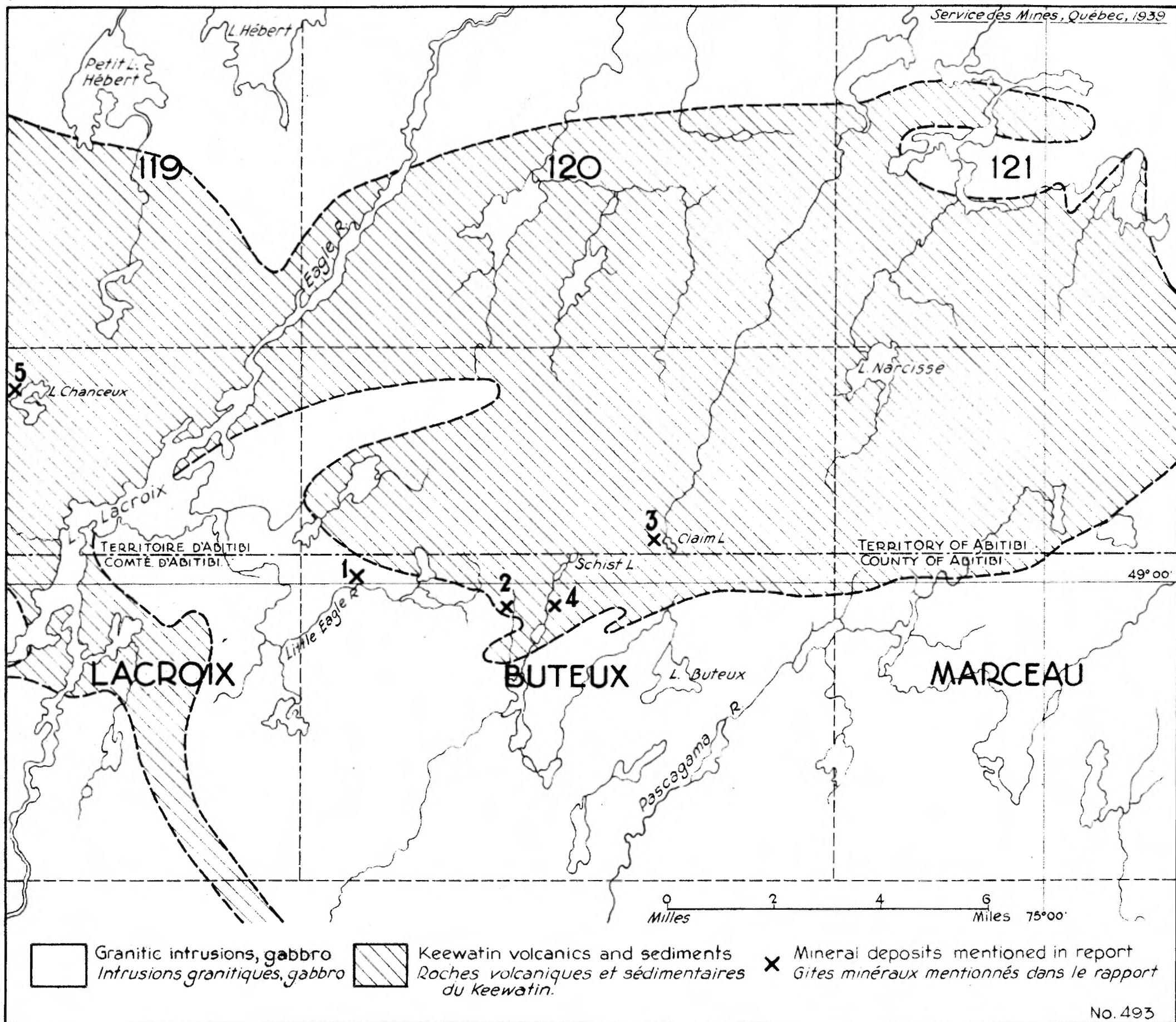
Summary

The four properties in Buteux township that have been described above occur along an east-west belt that lies near the contact of the grey gneiss with the lavas. The very limited amount of work done on these properties to date has failed to reveal any long or continuous 'breaks', and none of the veins or other mineralization so far discovered appears to hold much promise of developing as commercial ore-bodies. This contact belt, however, has not been adequately prospected. It undoubtedly has possibilities, and might well repay further and more intensive exploration.

The greywackes and slates that form the northern part of the Keewatin belt in the map-area appear to be poor prospecting ground. These rocks are all of about equal strength, and stresses to which they have been subjected have been relieved by flowage rather than by fracturing. Certain acidic bands within the lavas, however, have been fractured, and it is mainly in such rocks that mineralization has been found.

On the whole, the eastern section of the map-area appears to be less attractive than the western section as prospecting ground.

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	Granitic intrusions, gabbro <i>Intrusions granitiques, gabbro</i>		Keewatin volcanics and sediments <i>Roches volcaniques et sédimentaires du Keewatin.</i>		Mineral deposits mentioned in report <i>Gites minéraux mentionnés dans le rapport</i>
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— BUTEUX AREA — RÉGION DE BUTEUX —
(PRELIMINARY) (PRÉLIMINAIRE)