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SPECIAL REPORT ON THE AREA FROM FORGUES LAKE TO JOHAN BEETZ NORTH SHORE OF THE ST-LAWRENCE

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SPECIAL REPORT  
ON  
THE AREA FROM FORGUES LAKE TO JOHAN BEETZ  
NORTH SHORE OF THE ST-LAWRENCE

BY  
Jacques Claveau

QUEBEC  
1943

# GEOLOGICAL RECONNAISSANCE FROM FORGUES LAKE TO

## JOHAN BEETZ, NORTH SHORE OF THE ST-LAWRENCE

BY Jacques Claveau

### INTRODUCTION

During the fall of 1942, the writer made a geological reconnaissance, of nine days duration, from Forgues lake to the village of Johan Beetz, north shore of the St-Lawrence. Forgues lake lies in the uplands of the interior at latitude  $50^{\circ}50'N$ . and longitude  $62^{\circ}54'W$ . Johan Beetz is a small village, mainly of fishermen and their families, located on the gulf of St-Lawrence, at latitude  $50^{\circ}17'N$ , and longitude  $62^{\circ}48'W$ . and approximately due south of Forgues lake. The flying distance between these two points is forty miles.

Owing to the fact that fully one-half of this particular area is occupied by lakes with their connecting streams, travel by canoe is easy and relatively rapid, especially if one travels light. Portages are numerous but short. Along the route followed by the writer, thirty-four portages were encountered. Of these, four are approximately 35 chains long, three are 20 chains, nine between 10 and 15 chains, eight between 3 and 7 chains and the remaining ten are still shorter. The rapids between Beetz lake and Napoléon lake, and at the foot of Petit Piashti lake, opposite surveyor's tag 4, can easily be run with a lightly loaded canoe.

## FIELD WORK

A distance of fifty-five miles was covered in the course of the reconnaissance. As a rule, only one shore of the traversed lakes was examined. Occassionally, when time was available and conditions permitted, parts of the opposite shore and easily accessible hills or cliffs in the immediate vicinity were visited.

## ACKNOWLEDGMENTS

The base-map used for travelling and for plotting the geology was supplied by the Surveys Branch of the Quebec Department of Lands and Forests. It was found to be remarkably accurate, and the survey tags around the lake shores were extremely helpful.

The writer wishes to express his thanks to Albert Lebrun, of Havre Saint-Pierre, a trapper well acquainted with the region, who greatly helped in the planning of the trip by indicating and describing in detail the best route to follow. The party comprised the writer and Paul Blondin, of Senneterre, Abitibi county, who acted as canoe man and cook in a highly satisfactory manner.

## DESCRIPTION OF THE AREA

The area is one of medium relief, dotted with innumerable lakes of all sizes. The most characteristic feature is the presence of persistent north-northwest trending ridges that usually stand well above the average relief. The ridges consist of gabbro dykes, which are more resistant

to erosion than the surrounding quartzite. As the dykes dip very steeply, the ridges have abrupt walls, an attitude that is notably well defined along the eastern shore of the small lake southwest of Wakeham lake and along the short stream (600 feet long) joining these two lakes.

The fact that the Quaternary ice-sheets moved southward along a direction paralleling the strike of the gabbro dykes contributed greatly to emphasize the differential character of the erosional pattern and to leave the bed-rock swept clean of overburden in several places.

The post-Glacial drainage pattern was consequent upon the ice-dissected topography and many of the lakes occupy trough-like or basin-like depressions in the Grenville sediments between major gabbro dykes. The lakes are prominently elongated in a north-north-west direction and very frequently the shoreline follows the foot of a precipitous wall of gabbro. Such straight shorelines are conspicuous on the map and their prolongation is generally found to coincide with a contact line between gabbro and quartzite. The eastern shoreline of the small, narrow lake previously mentioned as lying immediately southwest of Wakeham lake, and the western shoreline of the little triangular lake just north of first Cabane Neuve lake, afford outstanding examples of the controlling nature of the dykes over the drainage pattern.

The drainage of the area is all directed toward the gulf of St-Lawrence, There is no master stream along the route followed by the writer and most of the rock-basin lakes are connected by short streams with falls and rapids. In several instances, a lake overflows into the next basin below by means of a single fall, a feature that explains why so

many of the portages are very short. The waters from Forgues lake to Napoléon lake, inclusive, drain into Bellinger lake (east of the present map-area) and thence by Grand Piashti river to Quetachou-Manicouagan bay, on the St-Lawrence about three miles east of Johan Beetz. A few small lakes southwest of Napoléon lake empty into Grand Piashti river about a mile below Bellinger lake. Devost, Croche, Goélands, and Cabane Brulée lakes drain by way of the last-mentioned into the same river, joining it about six miles south of Bellinger lake or five miles north of Quetachou-Manicouagan bay. Petit Piashti lake is drained by Petite Piashti river, which reaches the St-Lawrence at Johan Beetz. At the 200-foot fall, three miles north of Johan Beetz, one descends abruptly from the uplands to a country of marshy tundra where the monotonous flatness is broken only here and there by hills emerging from the unconsolidated sediments of the old Champlain sea. Such a hill, consisting of quartzite and gabbro, forms the southeastern shore of Salé lake. Incidentally, the latter derives its name from the sea water that invaded it at the equinoxial tides. During the daily periods of low tide, navigation between Salé lake and the sea is impracticable, as the channel of Petite Piashti river here is wide, flat, and bouldery.

## GENERAL GEOLOGY

### General Statement

All the consolidated rocks of the map-area are of Precambrian age. Between Forgues lake and Cabane Brulée lake, about eight miles from the St-Lawrence, the country is underlain by dykes of gabbro alternating with bands of fine-grained, pink to grey quartzite.

The southernmost part of the map-area, that is, between Petit Piashti lake and Johan Beetz, is underlain by pink and grey, slightly gneissic, biotite granite and reddish pegmatite containing numerous large inclusions of gabbro and quartzite.

One of the outstanding features of the geology of the area is the large number of gabbro dykes. These vary in width from a few inches to more than a mile. They seem very persistent and it is likely that, with further detailed mapping, it will be possible to follow most of them uninterruptedly from the shore of the gulf of St-Lawrence to at least Forgues lake, a distance of some forty miles, and probably for several miles beyond this lake.

The first rock of a granitic nature encountered in the course of the trip southward was a dyke of coarse, red pegmatite, 2.5 feet in width, cutting gabbro along the eastern shore of the small lake north of tag 698, which is at the north end of Cabane Brûlée lake. More pegmatite cutting across quartzite beds was observed south of tag 681, on the west side of the last-mentioned lake. On Petit Piashti lake, from tag 10 westward along the southern shore, gabbro gives place to a complex of quartzite, granite, and pegmatite, and finally to large masses of granite and pegmatite on both sides of the narrows leading to the southern extension of the lake.

Although granitic rocks are predominant between Petit Piashti lake and Johan Beetz, there are numerous occurrences of quartzite and gabbro in this part of the area. In one place at least, a few hundred feet above the 200-foot fall, three miles from Johan Beetz, the granite is in the form of dykes between quartzite beds. Elsewhere, it is more difficult to determine the true character of the granitic intrusion. It seems, however, that the southern

part of Petit Piashti lake and Petite Piashti river form roughly the eastern boundary of a main granite body, and the alternating outcrops of granite, quartzite, and gabbro suggest that the granite here consists of rudely sill-like tongues from the main mass into the pre-existing complex of gabbro dykes and quartzite beds.

TABLE OF FORMATIONS

PRECAMBRIAN	Post-Grenville intrusives	Pegmatite, pink to grey biotite granite  Gabbro-diabase dykes
	Intrusive contact	
	Grenville (?)	Reddish to grey, fine-grained quartzite, quartz-biotite schist, small lenses of coarsely crystalline limestone

GRENVILLE (?) SEDIMENTS

Quartzite

Practically all the sedimentary rocks of the area consist of thick beds of massive quartzite. The grain is very fine and the colour varies from pink to light grey. Variations in the grain size or colour are rare but not entirely absent. Some medium-grained types were observed, and green-

ish quartzite, owing its colour to chloritic impurities, was noted in a few localities. Thin layers of black sands, often in a cross-bedded position, are a common feature of the beds.

Weathering of the quartzite is very superficial but significant enough to impart to the rock a white colour that helps to differentiate it from the much darker gabbro. The quartzite is not as resistant to erosion as the gabbro and thus is seldom seen forming high hills or hogbacks, as does the gabbro.

In thin section, the quartz grains are seen to be closely interlocking and accompanied by feldspar, intensely altered but still recognizable as in part plagioclase and in part microcline. The grains of feldspar are ordinarily much smaller in size than those of quartz. Among other minerals present are chlorite, white mica, and apatite. The bands of black sands consist of a mixture of sphene and magnetite, in equal amount with a few grains of epidote.

The surface of the quartzite frequently shows numerous crescentic cracks arranged in a symmetrical pattern. The cracks are of two types; major cracks averaging from three to six inches in length, and minor, very fine and hairlike cracks of much shorter length. The latter are much the more abundant. The two sets are curved in opposite directions, that is, if the concave side of the major cracks is toward the north, the convex side of the minor cracks faces north. The writer believes these cracks to be the expression of stresses set up in the quartzite during folding.

### Quartz-Biotite Schist

This rock is a dark, compact schist found in a few large outcrops along the western bay near the outlet of Croche lake. In thin section, it is found to consist of brown biotite (50 per cent) and quartz (30 per cent), with a subordinate amount of strongly sericitized feldspar. Among accessories are phlogopite and muscovite, greenish tourmaline, apatite, and calcite. The biotite is segregated in bands and the flakes are disposed in a strikingly parallel arrangement.

### Crystalline Limestone

Crystalline limestone was observed in two localities. It was first seen south of tag 880, on the east shore of the northern narrows of Wakeham lake. Here, a thin lens of very coarse and friable crystalline limestone lies at the contact between gabbro and quartzite. Considerable quartz has been introduced along the contact and in the adjacent limestone. Under the microscope, it is to be seen that crystals of hornblende appear to have formed at the expense of calcite; and both calcite and hornblende are being replaced to some extent by quartz.

The second locality is about 2,000 feet east of tag 1003, on the east side of the northern part of the Second Cabane Neuve lake, where a thin, water-worn remnant of limestone occurs in schistose gabbro. Here, again, quartz is found surrounding and replacing the limestone.

## POST-GRENVILLE INTRUSIVES

### Gabbro-Diabase Dykes

The gabbro-d diabase is a very heavy, dark, fine to coarse-grained rock rich in iron oxides and containing between 55 and 65 per cent ferromagnesian minerals. Some of the outcrops, especially in the coarse grained types, show a pitted surface due to differential weathering.

The rock exhibits an ophitic to sub-ophitic texture, a feature that may readily be observed on the weathered surface of the medium and coarse-grained types, as the plagioclase weathers white. In thin section, the feldspar is seen to have the composition of intermediate andesine ( $Ab_{60}An_{40}$ ); it is seldom fresh, but is altered to sericite, zoisite, saussurite, and calcite. The crystals are zoned and the alteration is restricted to the central cores. The dark constituents of the rock are hornblende, occasionally housing cores of uraltite, with subordinate amounts of biotite, magnetite, and chlorite. Rims of sphene skirt some patches of iron oxides. Apatite is scattered throughout the rock in stout crystals or fine needles. Quartz is practically absent from the fresh rock.

As the gabbro-d diabase is highly altered and has lost much of its original character, with the exception of its diabasic texture, there is no true "fresh rock". Relatively speaking, however, the Forgues Lake gabbro may be said to be "fresh", since it still shows relics of the pyroxene that formed a constituent of the original gabbro. In all the other specimens of gabbro examined in thin section, the pyroxene has been completely altered to secondary minerals.

Under the microscope, the Forgues Lake gabbro-diorite reveals uraltite cores in greenish hornblende and amphibole, and uraltite pseudomorphs after euhedral crystals of pyroxene.

Along the western shore of Wakoham lake, near tag 887, the gabbro has undergone considerable change. In thin section, the plagioclase is seen to have been almost completely transformed by hydrothermal solutions, and the hornblende recrystallized to small crystals and segregated in bands. Magnetite has been crushed and the fragments distributed into long trains paralleling the amphibole bands. The space between the bands is filled with a fine mosaic of quartz and long, thin streaks of finely divided scapolite.

In the southern part of the Second Cabane Neuve lake, 800 feet northwest of tag 1002, gabbro outcropping near the water level displays a deeply pitted surface resulting from differential weathering. On the fresh fracture, the glistening faces of long lath-like plagioclase crystals may be seen. Under the microscope, the rock coarse-grained with most of the hornblende changed to innumerable and very fine flakes of biotite. Quartz and possibly calcite have been introduced and are replacing the plagioclase and the ferromagnesian minerals.

In a specimen from Cabane Brûlée lake, near tag 686, all the hornblende crystals exhibit a sieve-like structure. The plagioclase is intensely altered and a few flakes of biotite and muscovite are present throughout the groundmass. Considerable amounts of secondary albite and subordinate quartz have been introduced. Skeletal crystals of iron oxide are surrounded by rims of sphene.

In the southwestern extension of Goélands lake, a very coarse-grained rock containing laths of "pink" feldspar in a matrix of feathery hornblende outcrops over a length of 1,000 feet from tag 11 eastward. In the field, the rock grades eastward into gabbro and undoubtedly is itself a coarse, altered facies of the gabbro-d diabase in which the feldspar has been stained red by hydrothermal solutions. In thin section, although most of the plagioclase is altered beyond recognition, there is enough evidence left to indicate that it was zoned andesine. Sericite, zoisite, and a fine red dust that imparts the anomalous pinkish tinge, becloud the andesine. Secondary quartz is seen replacing the large hornblende crystals, and a mixture of small hornblende and quartz crystals is often found along the interstices between the crystals of plagioclase. It is likely that the intense alteration suffered by the gabbro in this zone is due to its proximity to the granite of Piashti lake.

At a few places throughout the area, the gabbro may be seen in actual contact with quartzite. One locality where the intrusive character of the contact is particularly well exhibited is on the west side of the northern narrows of Wakeham lake. Examination of a thin section of the contact rock shows that the size of grain of the gabbro becomes gradually finer as the contact is approached. A narrow zone, a quarter of an inch wide, separates the chilled edge of the gabbro from the quartzite. This zone consists of four distinct bands. Going from gabbro to quartzite, the sequence is as follows: a band of cryptocrystalline quartz with some epidote dust, a band in which hornblende is predominant, a band of fine-grained quartz, and, finally, a band of sphene and epidote.

The character of this contact, the presence, in other outcrops, of relics of pyroxene, and the zoning of the feldspars, seem to preclude all doubt as to the intrusive nature of the gabbro-diorite. The series of exposures of this rock which have here been described and mapped is in all probability the eastern and southern extension of a zone of similar rocks east of Forget lake and along the East Romaine river, west and northwest of Forgues lake.

#### Granite and Pegmatite

The youngest rocks of the area consist of pegmatite and pink to grey, slightly gneissic, biotite granite. They were observed only in the most southern nine miles of the area examined.

Along the narrows joining the wider northern and southern parts of Petit Piashti lake, the granite is coarse-grained with reddish feldspars. Biotite is abundant and is "wrapped" around areas of quartz and feldspar, imparting a vague eye-like texture to the rock. Microcline forms 30 per cent of the rock, quartz 25 per cent, and zoned plagioclase of acid andesine composition ( $Ab_{70}An_{30}$ ) 20 per cent. The plagioclase is stained brownish-red and altered to saussurite, sericite, and chlorite. The red stain is clearly visible in the hand specimen and makes possible the megascopic distinction between the andesine and the microcline. Among minor constituents are calcite, apatite, magnetite, leucocene, and traces of chalcopyrite.

At the 200-foot, three miles north of Johan Beetz, the granite is pale and very friable. It consists of microcline (50 per cent), quartz (20 per cent), andesine (20 per cent), biotite partly

converted to chlorite, some microperthite, magnetite, apatite, and zircon.

A thin section from a greyish facies in the granite near Johan Beetz, discloses a slightly less acidic zone. Microcline, andesine, and quartz are present in equal amounts, with subordinate biotite and accessories such as muscovite, apatite, magnetite, and leucoxene. The feldspars are relatively fresh and quartz is occasionally seen in vermicular intergrowth with them.

Pegmatite dykes cutting the granite are abundant. In places around Petit Piashti lake, and less commonly elsewhere, granite and pegmatite grade into one another, forming a baffling mixture. The large percentage of andesine in the granite and the presence of andesine in the gabbro-diabase of the area suggest the possibility that both intrusives were derived from the same parent magma, the granite being a late acidic differentiate.

### STRUCTURAL GEOLOGY

The strike of the formations, bedding and schistosity is remarkably uniform throughout the area and averages  $N.25^{\circ}W$ . From Forgues lake to Beetz lake, all the formations dip very steeply to the east. In 21 of a total of 25 observations in this interval, it was found that the dips are steep toward the east or nearly vertical. A zone of local disturbance occurs along the short river stretch between First and Second Cabane Neuve lakes, where, on an island, quartzite in contact with a dyke of gabbro strikes  $N.75^{\circ}E$ . and dips 70 degrees north. It was not possible to determine the true nature of the disturbance, but the straight southwesterly course of the river here suggests a sharp fold or a fault.

From Beetz lake to Johan Beetz, all the formations dip to the west. It would seem that an anticlinal axis of major importance trends about N.25°W. through, and parallel to, Beetz lake and for an unknown distance beyond this lake. All the rocks observed during this investigation north of this lake are probably on the eastern limb of this anticline, while those south of the lake are on the western limb. The average easterly dip is 72° and the average westerly dip 56°. Thus the antiline, which is probably a broad regional structure, is asymmetrical, with a steeply dipping eastern limb and a more gently dipping western one.

In the southernmost part of the area - between Petit Piashti lake and Johan Beetz - However, the formations show a tendency to swing in a broad curve from N.25°W. to N.35°E. Thus, the trend of the major anticline axis that is believed to pass through Beetz lake may swing southwestward as it approaches the seashore. That this change of direction actually does take place is further indicated by the writer's examination of the geological features for a distance of eight miles along the shore, from Johan Beetz eastward to Little Watsheshou river. Along this section of the shore, there are long northeasterly trending bays, suggestive of erosion along the strike of the formations, and, indeed, beds of quartzite in the vicinity of Grand Watsheshou river, which flows into the St-Lawrence at a point five miles east of Johan Beetz, strike N.35°-50°E. and dip steeply to the west.

In resumé, the information obtained thus far justifies picturing the structure as a broad anticline trending S.25°E. from Forgues lake to a point outside of the map-area somewhere southeast to the lake. From there on, the anticlinal axis may describe a broad arc that brings it into a

northeasterly orientation in the vicinity of the vicinity of the seashore.

The quartzite and gabbro do not show signs of extreme deformation; the beds and the dykes follow a remarkably persistent trend. The quartzite forms predominantly thick and massive beds and the gabbro is rarely sheared or schistose.

It is not known whether the gabbro was intruded before or after folding of the quartzite, but it is likely that, if it were pre-folding in age, the dynamic forces that caused the folding would have rendered the rock schistose. The inclusions of gabbro in granite indicate clearly that the latter is the younger of the two. In some places, the granite appears to be pegmatitic whereas, in others, it is cut by dykes of red pegmatite, which is the youngest intrusive observed in the region.

### ECONOMIC GEOLOGY

No prospecting has ever been carried on within the limits of the map-area, except along the seashore. Mineralization is widespread and includes the two sulphides, chalcopyrite and pyrite.

### CHALCOPYRITE

Appreciable concentrations of chalcopyrite were found in four localities.

(1) The most important chalcopyrite mineralization was seen at a point about 500 feet south of tag 880, on the east side of the northern narrows of Wakeham lake. Here, the contact between gabbro and quartzite can be followed over a distance of

50 feet. To the north, it disappears under the water of the lake and, to the south, it is hidden by overburden. In places along the contact, the sedimentary rocks have been eroded more deeply than the gabbro and the depressions thus formed are filled with mud and water. At a point along the contact, ten to fifteen feet north of where the contact disappears beneath overburden, a quartz vein three to four inches wide may be seen emerging from one of the water-filled depressions. The vein extends southward for a length of about a foot before petering out; and northward, under water, it continues for a distance that could not be accurately ascertained but which does not exceed fifteen to twenty feet, as the northern part of the contact, is devoid of quartz. Near the southern end of the vein, a lenticular block of limestone, one to two feet long and six inches wide, occurs with the quartz of the vein and is partially replaced by it.

At the southern end, where it disappears in the water-filled depression, the vein carries chalcopyrite irregularly distributed as stringers, veinlets, and small lenses, which fill fractures in, and also replace quartz. The mineralization also extends for three to four inches into the gabbro, in which fractures up to half an inch wide are filled with chalcopyrite and very little pyrite. A few well-developed crystals of chalcopyrite occur in the limestone. Elsewhere than along and near the vein, mineralization in the contact zone of gabbro and quartzite is very sparse or wanting. No sulphides were observed in the quartzite.

Grab samples of mineralized quartz and gabbro from this locality were mixed together for purposes of assay and were found to contain:

3.74 per cent copper, and 0.040 oz. gold and 1.635 oz. silver per ton.

(2) Chalcopyrite was found along the northern side of the falls about 700 feet south of tag 982, or about two miles south-southeast of Wakeham lake. The mineralization occurs in gabbro approximately sixty feet east of its contact with quartzite. A quartz veinlet, an inch to an inch and a half wide, carrying chalcopyrite and pyrite, runs roughly east-west. It is cut by a stringer of solid chalcopyrite, one-eighth of an inch thick, which trends parallel to the strike of the quartzite-gabbro contact, that is, about N.17<sup>OW</sup>. The length of the veinlet was not determined.

(3) Around the point 800 feet northwest of tag 1002, on the east side of the southern part of Second Cabane Neuve lake, veinlets and patches of quartz accompanied by considerable chalcopyrite were observed over an area of about four square feet in gabbro which is exposed here along the lakeshore.

(4) Along the north side of the westerly trending bay of Croche lake, near its outlet, outcrops of quartz-biotite schist carry nodules and "eyes" of pyrite and chalcopyrite.

### Pyrite

Pyrite, and to a minor extent chalcopyrite, are sparsely but persistently disseminated throughout the gabbro dykes of the whole area. In three localities, pyrite occurs abundantly:

(1) In the gabbro on the east side of the northern part of Forgues lake, a quarter of a mile

north of tag 919, the enclosing walls of two narrow shear-zones, two to three inches wide, carry large amounts of finely divided pyrite. The material of the shear-zones is soft, rusty, gouge-like matter devoid of sulphides.

(2) Abundant pyrite, accompanied by a little chalcopyrite, may be seen in the body of strongly schistose and altered gabbro exposed 2,000 feet east of tag 1003 on an east-west stretch of shoreline which here forms the east side of the northern part of Second Cabane Neuve lake.

(3) Pyrite is plentiful in the zone of coarse-grained gabbro that contains the "pink" feldspar in the southwestern corner of Goélands lake.

### Suggestions for Prospectors

In all these occurrences, the chalcopyrite and pyrite are usually associated with quartz and are found in gabbro, commonly near or at its contact with quartzite. No appreciable quantities of these sulphides were seen in the quartzite. They were, however, observed in pegmatite, near its contact with amphibolite. It is likely that the copper occurrences of the region are all of the same period of mineralization, and later in age than the granite.

The widespread occurrence of chalcopyrite and pyrite throughout the map-area, in the neighbouring area to the west and northwest, and along the St-Lawrence coast east of the section covered by this report, indicates that at one time copper-bearing solutions circulated abundantly in the country rocks. The known occurrences of copper mineralization are sufficient in number to encourage prospecting in the hope of finding, somewhere in the region, deposits of commercial importance.

The most promising localities, from the evidence so far available, appear to be in the neighbourhood of the gabbro-quartzite contacts. The lanes of contact afforded good channels for the ore-bearing solutions, which also could have been effectively restricted by the damming qualities of the thick, massive, fine-grained quartzites.

The fact that remnants of limestone, wherever served in the area, are partially replaced by sulphide-bearing quartz suggests that limestones and remnants of limestones might be favourable host-rocks for deposits of ore-minerals, especially near the contacts of these rocks with bodies of gabbro. It is possible that some of the gabbro was intruded along zones of weakness between beds of quartzite and limestone, and that the limestone was engulfed by the intrusive mass. Inclusions of limestone or of its altered derivative in the igneous body, being readily soluble, offer conditions suitable for the accumulation of ore-minerals from solutions which might pass through them. The prospector, then, would do well to pay attention to such rocks wherever he may encounter them.

Areas underlain by granite or pegmatite should not be neglected, especially as it is known that copper minerals (bornite and chalcopyrite) occur in pegmatite and granitized gneiss at two points on the St-Lawrence shore, three-quarters of a mile west and one mile east, respectively, of the mouth of Grand Watsheshou river, which is five miles east of Johan Beetz.

The area does not appear to have a heavy blanket of overburden. Thus, stripping and systematic examination of contact zones should be relatively easy and rapid.

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