RP 209(A)

PRELIMINARY REPORT ON BELLETERRE MAP-AREA (SHEET NO 3), BLONDEAU TOWNSHIP, TEMISCAMINGUE COUNTY

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PRELIMINARY REPORT

ON

BELLETERRE MAP-AREA (SHEET No. 3)

BLONDEAU TOWNSHIP

TEMISCAMINGUE COUNTY

BY

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1947

P. R. No. 209

BELLETERRE MAP-AREA

(Sheet No. 3)

Blondeau Township, Témiscamingue County

by

P.-E. Auger

I N T R O D U C T I O N

During the field season of 1947, the geological mapping done in Guillet township in 1945 (1) and 1946 (2) was extended westward into Blondeau township in order to cover the western end of what may be called the Belleterre Belt.

The area examined and mapped is bordered on the east by the Blondeau-Guillet township-line, on the west by Girard and Moore lakes and on the south by Morand and Froid lakes. The northern border is an east-west base line extending westward from the Blondeau-Guillet township-line. The map-area is in the form of a rectangle, which is 11,400 feet wide (east-west) and 27,000 feet long (north-south). It may be reached by motor

(1) Que. Dept. Mines, P.R. No. 194.
(2) Que. Dept. Mines, P.R. No. 203.

vehicle, since the Ville-Marie-Belleterre highway crosses the centre, from east to west. The nearest railroad station is Laverlochère, which is served by the Canadian Pacific railway.

Approximately one third of the map-area is covered by surveyed claims, on which a geophysical survey has been made in previous years. The area is thus provided with a series of north-south lines spaced at regular intervals. These lines were found to be very useful for mapping purposes. East-west base lines were established in the remaining two thirds of the area, and they were used to tie in compass traverses.

GENERAL GEOLOGY

The map-area is entirely underlain by Precambrian formations covered in most places by a thin layer of glacial débris. The relief is slight, and outcrops are scarce, except along some fault scarps or low hills that rise in the areas underlain especially by intrusive rocks. Most of the greenstone is visible in trenches dug out by the different companies that have performed exploration work in the area.

The oldest formations mapped are the volcanic rocks of Keewatin type; these are intruded by diorite and different types of acid and basic intrusive dykes. The most important body of intrusive rock is that which borders the map-area on three sides, namely: north, west, and south. A complex of diorite and gabbro underlies a large area near the western border of the area along the contact between greenstone and granite.

Table of Formations

Quaternary		Stream and swamp deposits Sand and gravel
Precambrian	Intrusives	Diabase dykes Lamprophyre dykes Syenite, syenite porphyry Granite porphyry Granite Gabbro-diorite Diorite
	Keewatin-type	Acidic volcanics Basic volcanics, including diorite phases Chlorite sericite-schist and serpentine Volcanic breccia and fragmentals Tuff

Keewatin-Type Volcanic Rocks

Lavas and related rocks occupy the larger part of the area described in the present report. Most of these rocks are intermediate to basic volcanics containing in a few places well developed volcanic structure-like pillows, flow lines, and brecciation. Fragmental volcanic rocks and breccia are quite abundant in the southern part of the map-area and in a few bands of volcanics farther north.

Acidic lava is not abundant. A few outcrops of such rock may be seen in the western part of the property of Blondor Quebec Mines and also a short distance south of the centre line of Blondeau township, about 2,000 feet from the western border of the map-area. These however have no great extent, and they are probably acidic phases of some intermediate lava flow.

Most of the basic to intermediate volcanic rock is slightly schisted and has been altered to chlorite and sericite schist. Serpentine, in some places containing asbestos, has been found in the more basic volcanic rocks. Breccia is abundant in several places. There is one band of similar volcanic breccia about 1,500 feet south of the centre line of Blondeau township. This band may be followed for a distance of 1,500 feet to the western border of the map-area. Breccia and fragmental volcanics are found in large amount in the southern half of Guillet Gold Mines property at the western end of Sand lake. These are interstratified with massive and banded basic lavas and with numerous tuff bands.

Silicified tuff beds are visible at numerous places especially in the northern part of the map-area, on Blondor Quebec Mines property. Farther south on Guillet Gold Mines property tuff layers

are very abundant but much less silicified. At both points they are good horizon markers, and they are accompanied in places by vein material.

INTRUSIVES

Intrusive rocks are abundant and varied in the present map-area. They are composed of large masses of batholithic size, intrusive bosses, and dykes which in most places seem to be structurally related to the general attitude of the volcanic formations.

Diorite

Diorite or 'older gabbro' dykes and masses are very numerous throughout the region. As a rule these bodies of diorite seem to follow roughly the general trend of the structure and thus give a definite impression that they are flows rather than intrusives. Yet, at several places definite dykes of diorite may be seen to cut across flow contacts or even tuff beds.

Gabbro-Diorite Complex

A very coarse gabbroic intrusive, along with typical diorite, forms an almost continuous mass along the western border of the map-area. The dioritic phase forms the largest part of the intrusive that occupies the contact zone between granite to the west and greenstone to the east. The diorite is very similar to that found elsewhere throughout the area in the volcanic rocks, except that it is usually coarser grained and occupies larger areas than any other dioritic body found in the district.

The gabbro phase is less extensive than that of the diorite. At one place only a definite contact could be seen between the dioritic and the gabbroic phase of the intrusive. In most places a gradational change from diorite to gabbro is visible. The gabbro is very coarse, blocky and massive, dark in color, and is composed mainly of grey feldspar and a large percentage of ferromagnesian minerals. In places along Moore lake some of the volcanic rocks seem to break through the diorite-gabbro complex as far as the lake shore. Along the north shore of Morand lake there seems to be a tongue of this intrusive body extending in an easterly direction parallel to the greenstone and the syenite that underlies the area on its southern border. But here there is a band of greenstone which separates the diorite-gabbro complex from the syenite.

It seems that this intrusive body is structurally controlled by a large fault which runs in a N.10°E. direction along Moore lake and the east side of Girard lake and extends northward for several miles. Along the south side of the map-area a continuous depression, occupied by Morand lake, Sand lake, and a low swamp connecting both lakes may be the topographic expression of a fault line along the north side of which the intrusive complex has been injected.

Granite

Granite is the most abundant intrusive rock in the map-area. It extends across the northern section of the map-area. On the west and north sides, it underlies the area immediately beyond the border of the map-area on the north shore of Gauvin lake and the west shore of Moore and Girard lakes.

The granite is coarse to medium grained, quite massive, and composed mainly of quartz, pink and white feldspar, and small amounts of ferromagnesian minerals. In numerous places porphyritic texture is prominent with feldspar phenocrysts in a matrix of feldspar, quartz, and ferromagnesian minerals. Along the contacts between granite and greenstone it is not uncommon to see a well marked lineation parallel to the structure of the volcanic formations extending into the granite.

Granitic dykes are abundant in the volcanic rock, especially along the granite contact in the northern part of Blondor Quebec Mines property.

Granite Porphyry

Granite porphyry dykes are numerous, especially in the northern and western parts of the map-area. Their location seems to indicate that they represent the marginal modification of the granite body. The rock is composed of large idiomorphic crystals of quartz and feldspar , with mica and hornblende in very small quantities inclosed in a fine-textured crystalline groundmass of feldspar and quartz with some ferromagnesian minerals.

These dykes are observed to cut greenstone or diorite.

Syenite, Syenite Porphyry

Syenite forms a large mass which seems to extend beyond the southern limits of the map-area. It is also found in large dykes up to 20 feet wide and in irregular outcrops cutting the volcanic formations in the southern part of the map-area, a short distance from the larger mass of syenite.

These dykes may represent the equivalents to the granitic dykes to the north, but here they are syenitic on account of the low quartz-content of the intrusive mass. The rock is coarse grained, massive, and pink. It is composed of pink feldspar with biotite and hornblende.

Syenite porphyry dykes are found mostly in the southern part of the map-area and also at several places within the area. They are composed of large phenocrysts of white albite and pink orthoclase up to three quarters of an inch long in a matrix of fine-grained feldspar, hornblende and mica.

Lamprophyre Dykes

Dykes of lamprophyre are numerous throughout the map-area. Most of the lamprophyres encountered were of the mica-rich-type. These dykes cut the greenstone, the diorite, and the granite. Very few are visible on surface outcrops, but diamond-drill core on the properties of Blondor Quebec Mines, Girard Lake Mines, and Guillet Gold Mines showed that lamprophyre is abundant. One dyke was observed to cut the granite batholith on the western boundary of the northern part of the map-area.

Diabase Dykes

Diabase crops out at the surface in the form of an east-west intrusive body along the south border of the gabbro-diorite complex on the north shore of Morand lake. Farther north, about 2,000 feet north of Morand lake, there are several outcrops of a similar diabase that seem to be aligned to form a dyke striking N.10°E., which is possibly an off-shoot from the larger body cropping out farther south. The rock is coarse to medium

grained, very massive and basic, and is composed in most places of pyroxene and amphibole with small amounts of dark feldspar. The chocolate-brown weathering is about one quarter to one half an inch deep, and it shows the characteristic sharp contact with the fresh, dark rock below the surface.

STRUCTURE

The structure of the present map-area is the westward continuation of the structure already described on Belleterre Map-Areas (Sheets No. 1 and No. 2).

The volcanic formations trend in an almost east-west direction along the eastern border of the map-area, except north of the highway where the trend is slightly north of west. As they cross the area westward, the formations swing gradually to the north and even to the northeast in the northern part of the Keewatin-type series. Their dip is generally steep. It is very evident in the northern part of Blondor Quebec Mines property that the strike of the formations is directed into the east-west granite contact and that the formations do not fold back on themselves along the contact, as it was believed they did on the property of Ortona Gold Mines (1). In several places the structure seems to impress itself on the granitic formations for a short distance north of the contact. This impression is expressed by a definite lineation and crystal orientation in the intrusive for as far as 100 feet from the contact. To summarize the general structure of the area, we may say that the volcanic formations along the south edge of the granite batholith form a definite anticlinal fold plunging steeply south. Along

(1) Belleterre Map-Area (Sheet No. 1); Que. Dept. Mines, P.R. No. 194, p.7.

the granite border the local structural pattern is parallel to the contact, where the contact is oriented north-south; where the contact is east-west, however, the strike of the structural pattern is directed toward and into the granite.

Local drag folds are visible here and there in the area, but the most important drag fold is that which may be followed along its axis from the south end of Blondor lake in a direction S.60°W. for a distance of approximately 9,500 feet to the narrows between Girard and Moore lakes. The drag folding increases in intensity and amplitude toward the west and is probably the result of the sharp swerving toward the north of the volcanic formations in this part of the map-area.

In the southernmost part of the area the structure does not seem to conform to the general trend of the formation, and the attitude of the flows seems to indicate a definite east-west or even southwest trend completely across the map-area. It is quite possible that the tongue of gabbro-diorite intrusive along the north side of Morand lake, as well as a fault crossing the area in the vicinity, is responsible for this divergence of attitude.

Faults and shears are visible at a few places, especially on the properties of Blondor Quebec Mines and Guillet Gold Mines. The most important fault lines are however the Moore Lake fault, which is located along the western boundary of the map and has its topographic expression in the form of a steep scarp line which may be followed northeastward for several miles, and the fault possibly located along Morand lake and the low swamp that connects this lake to the western end of Sand lake. This latter fault is indicated by definite shearing in a southwesterly direction on outcrops on both sides of the swamp and seems to lie approximately on the southwestward projection, along its

strike, of Mud Lake fault.

As may be seen from the accompanying map, the shape of many of the lakes throughout the area has been determined by the structure of the rock formations.

ECONOMIC GEOLOGY

There is no producing mining property within the limits of the present map-area. Several companies have done extensive surface work and large amounts of diamond drilling, but up to the present none has done any underground development.

Blondor Quebec Mines, Limited

This property is in the northeastern part of the map-area. Its ground extends into Guillet township a few hundred feet east of the north-south township-line. Most of the property however is in Blondeau township. It comprises a group of claims in which veins were uncovered and explored.

Vein No. 1. - This vein is one of the first gold-bearing showings that has been discovered in the Belleterre area. It is located along the north side of the Ville-Marie-Belleterre highway at the southwestern end of Chevrier lake. The main part of the vein is in Guillet township, but its western extremity lies across the township-line and in Blondeau township.

It is an irregular, drag-folded vein that follows a narrow shear zone and a series of tuff bands, especially at its western end. The general strike of the vein is a little south of west, and the dip varies from vertical to 60° south.

The vein was followed along the strike for 250 feet, and its average width is 2 to 3 feet, except where it joins the tuff bed at its western end. At this place the vein is composed of a series of quartz veins interlayred with the tuff over a total width of 10 to 25 feet. At this point there is a granite-porphyry dyke which follows the bedding in the tuff and both are faulted off and displaced by a fault striking N.60°W.

The vein is composed of glassy quartz, banded in places, and contains some pyrite, a little chalcopyrite, and some magnetite, especially in the tuff-band section. High assays and some free gold have been reported from this vein. Diamond drilling did not reveal any vertical extension to the showing.

Vein No. 2. - Vein No. 2 is a small vein which crosses the Guillet Gold Mines road about 400 feet south of the Ville-Marie-Belleterre highway. It is a few inches to two feet wide, and it has been traced along the strike for about 100 feet. It strikes approximately east-west and dips steeply south. The vein is composed of smoky quartz in a narrow shear in the greenstone. A little pyrite and a few grains of chalcopyrite are visible in places.

Vein No. 3. - No. 3 vein is about 400 feet north of the Ville-Marie-Belleterre highway, and its east end is 600 feet west of Chevrier lake. The vein follows the general structure of the region for most of its length. It occupies a narrow shear zone in the basic volcanics, strikes, east-west, and dips steeply to the south. It was traced at the surface for a distance of 800 feet, and its width is one to two feet, except at a few places where it swells up to short lenses of greater width. At the western end of the vein, the trend of the formations makes a sharp bend toward

the north. At this point the vein seems to split into several veins over a total width of about 15 to 20 feet. These branch veins swing north along with the structure and have not been explored to their northern end. From this northward bend in the vein and the structure, there is another branch of vein No. 3 which continues westward along a narrow shear. This vein is only a few inches wide, and it has been uncovered at the surface for a short distance only, diamond-drill holes having intersected it along its strike.

Vein No. 3 is composed of glassy, white and smoky quartz, containing minor amounts of pyrite and pyrrhotite with a few grains of chalcopyrite and sphalerite. Some good assays in gold were obtained from several places in the trenches and also in the intersections in the drill holes, such as: 1.55 ounces over 0.75 feet for the highest assay recorded. No orebody of commercial importance has been disclosed in this vein.

Vein No. 4. - Vein No. 4 is a small vein along a shear zone at the southeastern end of Blondor lake. This vein is east-west, and it has been exposed in one trench only.

Vein No. 5. - Vein No. 5 was exposed in a trench along the south side of the Ville-Marie-Belleterre highway in front of the core-shack of Blondor Quebec Mines. It was covered up at the time of the writer's visit, but it is said to be a small vein of no importance.

Vein No. 6. - No. 6 vein is along the north side of the Ville-Marie-Belleterre highway, about 700 feet west of the Blondor core-shack. It is a quartz vein about one foot wide striking east-west and dipping 40° south. This vein is visible over a few feet only. It appears to occupy a tension crack in diorite. Good assays in gold were obtained from this vein.

Veins No. 7 and No. 8. - These are white quartz veins in greenstone and diorite in the northern part of the property near the granite contact.

Vein No. 9. - This vein is along the southwestern shore of Blondor lake. It is a quartz vein about one foot wide striking N.25°W. and dipping 75° north in a shear zone accompanying a tuff band. Small quantities of pyrite and chalcopyrite are visible in the quartz.

Other small veins are mineralized shear zones are visible elsewhere in the southern half of the property, but they are all of minor importance.

Guillet Gold Mines, Limited

The Guillet Gold Mines property is located in the southern half of the map-area, and it is bordered on the east by the Guillet-Blondeau township-line.

Vein No. 1. - The east end of this vein is approximately 500 feet west of the west end of Sand lake. It is uncovered by pits and trenches for a distance of 400 feet and its width varies from a few inches to three feet. The vein occupies a shear zone striking N.60°E. in intermediate, basic, banded volcanics and volcanic breccia. The shear zone is up to three feet wide and in places it contains some sulphides. The vein itself is composed of bluish and white quartz with some carbonate. Disseminated sulphides are present in several places.

Vein No. 2. - Vein No. 2 is approximately 250 feet south of the east end of vein No. 1. It occupies a shear zone in the banded brecciated volcanics. It strikes N.75°E. and dips 80° south. The shear is up to 7 feet wide, quite rusty in places, and contains abundant sulphide mineralization. It was

uncovered in trenches over a total distance of 250 feet, and the greatest width of quartz measured in the shear is 2.5. feet. The quartz is of the banded rusty-blue variety containing some pyrite and chalcopyrite.

Vein No. 3. - The east end of vein No. 3 is 650 feet west of the western end of vein No. 1. This vein occupies a small mineralized shear zone in a brecciated tuff band. It strikes approximately east-west and has a vertical dip. It has been opened up by trenches along a total distance of 750 feet, and its greatest observed width is 2 feet. The vein is composed of smoky banded quartz generally containing abundant sulphides, but it is very lenticular and in places is only a few inches wide.

Diamond drilling was done on these veins and at several other places on the property, but it was not possible for the writer to obtain the data concerning this drilling.

Girard Lake Mines, Limited

This property is immediately west of Blondor Quebec Mines. Numerous trenches and a few drill holes represent the development work done on the property, but very few veins are visible and they are all small.