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PRELIMINARY REPORT ON THE NORTHEAST QUARTER OF FIEDMONT TOWNSHIP, ELECTORAL DISTRICT OF ABITIBI-EAST

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MINERAL DEPOSITS BRANCH

PRELIMINARY REPORT
ON THE
NORTHEAST QUARTER
OF
FIEDMONT TOWNSHIP
ELECTORAL DISTRICT OF ABITIBI-EAST
BY
W. G. BROWN



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PRELIMINARY REPORT
ON THE NORTHEAST QUARTER OF
FIEDMONT TOWNSHIP
ELECTORAL DISTRICT OF ABITIBI-EAST

by

W.G. Brown

INTRODUCTION

Fiedmont township is in northwestern Quebec and its northern boundary is half a mile south of Barraute, a village located at latitude $48^{\circ}26'$ and longitude $77^{\circ}38'$, along the transcontinental line of the Canadian National Railways.

The area, mapped in 1957, comprises the northeast quarter of the township and lots 20 to 31 of range IX and X, in the northwest quarter, which were re-studied (1)^x on account of the extension into them of zones of base metal mineralization best defined in the northeast quarter.

The area is of easy access through the Val d'Or-Barraute gravel highway which crosses its western part and good secondary roads which reach within two miles of all its parts, except for the southeast quarter which is accessible through a trail branching off the Val d'Or highway in the middle of range VI. The north half of Fiedmont lake lies in the southwest quarter of the area and Laflamme river, which drains it, flows northward across the western half.

Except for a few hills in the southeast corner, the relief of the area is very low and glacial lake clays form most of its surface. Rock exposures project a few tens of feet here and there above the plain and make up about 3 per cent of the area. Most of them occur east of the Val d'Or highway in a 2,000-foot wide belt trending 20 degrees east of north and extending almost continuously through ranges VIII, IX and X, except for a 4,000-foot gap straddling the line between ranges IX and X. The hills of the southeast corner are underlain by the Pascalis-Tiblemont batholith. They contain a few low and scattered rock exposures but it is commonly possible to detect the bebrock beneath a foot or so of moss and soil.

The area is included in the Fiedmont (2) and the Senneterre (3) sheets of the Geological Survey of Canada and adjoins to the north and west two areas previously mapped at the scale of one inch to 1,000 feet by the Quebec Department of Mines (4 and 1).

GENERAL GEOLOGY

All the consolidated rocks of the area are of Precambrian age. The oldest rocks are Keewatin-type andesites, dacites, and basalts with very few pyroclastic

x Numbered references are listed at end of report.

rocks. Tremblay (2) has classified this series with the Kinojevis group of volcanic rocks.

Intrusive rocks related to the Pascalis-Tiblemont batholith crop out in the southeast part of the area extending as far as the Val d'Or highway and dykes and sills belonging to the Lacorne batholith occur throughout the whole area west of the same road, with one stock straddling the northern boundary. Most of the intrusions are roughly conformable with the lava flows but a few small dykes cut across their strike in range VII. Aeromagnetic contours and diamond drilling indicate that they are part of a tongue-like projection of the Lacorne batholith which has the same general strike as the dykes themselves.

A large number of other dykes and sill-like bodies also invaded the lavas posterior to their folding. Those dykes are mostly made up of diorite, quartz diorite, granodiorite, intrusive rhyolite, and feldspar porphyry.

Near the contacts between the batholithic and the volcanic rocks, the latter have been metamorphosed into amphibolites. On the other hand, in the vicinity of the satellitic bodies, the lavas have been silicified to form a variety of massive to banded rock types.

A Keweenaw-type quartz diabase crops out in a series of interrupted dykes near the western boundary of the map-area.

Table of Formations

Cenozoic	Recent	Stream and swamp deposits
	Pleistocene	Lacustrine clays, till, sand, gravel
Proterozoic	Keweenawan-type intrusive rocks	Quartz diabase
Archean	Post-Keewatin-type intrusive rocks	Biotite-hornblende granodiorite, hornblende monzonite Intrusive rhyolite Albite granite Feldspar porphyry Diorite, quartz diorite
	Keewatin-type volcanic rocks	Metamorphosed lavas: amphibolite, amphibolite schist, acidic biotite schist, silicified lavas associated with satellitic rocks, injection gneiss Andesite, basalt, dacite, dacitic flow breccia, minor pyroclastic rocks

Keewatin-type Volcanic Rocks

General Statement

The best exposed occurrence of Keewatin-type volcanic rocks are found on lots 48 to 51, range VIII, lot 51, range IX, and lots 51 to 53, range X. They form a belt about 16,000 feet long which cuts across the regional structure at approximately right angles. They lie in a conformable manner and seem to occupy a synclinal trough. Andesitic flows are at the bottom of this trough and have a minimum thickness of 5,000 feet. Above the andesite is a 1,500-foot zone of dacite and the uppermost flows are basaltic and are at least 1,000 feet thick.

Basic Volcanic Rocks

Relatively fresh to intensely altered basic lavas cover about 40 per cent of the area, mostly in its northern half. They are made up of andesite and basalt with their metamorphosed equivalents. In fact, exposures of the altered varieties are much larger and more abundant than those of the normal types of lavas.

The normal andesite, which crops out mostly in the eastern part of ranges IX and X, is a uniform fresh-looking, green and only slightly schistose rock in which amygdules and bun-shaped pillows are relatively abundant. Most pillows are, however, somewhat deformed and few good indications of the position of the flows could be obtained from them. The andesite weathers dark green although the pillows commonly take a white tint towards their centre, a peculiarity which commonly gives the rock the appearance of a pyroclastic material. Small weather pits are also abundant in the rock.

Relatively good exposures of basalt are present near the centre of range VIII, on lots 48 to 51. The rock is darker and denser than the andesite. Shearing has obscured most of its primary structures but a few examples of mattress-type pillows were seen in it. The presumed westerly extension of the belt of basalt exposed in range VIII was cut by drill holes on lots 33 to 35, range IX. The cores from those holes show a fine grained, equigranular and uniform aggregate of feldspar and mafic minerals similar to the rock cropping out in ranges VIII.

In range X and elsewhere throughout the zones of andesite, altered facies of the rock crop out abundantly or have been recognized in diamond drilling or underground workings. Those facies will be described later in this report.

One narrow bed of pyroclastic rocks is shown on the map in range X, on lots 50 to 54. The rock is made up of white weathering fragments set in a green schistose matrix. At first glance, it resembles some of the pillowed andesitic lava but the fragments are well graded and increase in size northward from $\frac{1}{4}$ inch up to 3 inches across.

Intermediate Lavas

Good exposures of intermediate dacitic lavas occur on lots 32 to 39 and 47 to 51, range VIII, and smaller ones on lots 32 and 33, range IX. They form two bands about 2,000 feet wide which are separated one from the other by a zone of basalt. The best exposures are a few hundred feet south of the line between ranges VIII and IX. There, the fresh rock is grey to light green and weathers light greyish green to white. Pillows and flow breccia are omnipresent in the dacite, with the central part of the pillows and the breccia fragments weathering white whereas the remainder of the flows and the matrix of the breccia weather light grey green. Despite that difference in weathering and the fact that the fragments of the breccia do not weather readily as does the matrix, there does not seem to be any difference in composition between the two. The fragments vary in size from a fraction of an inch to one foot across and are haphazardly distributed in the rock. Quartz amygdules are also abundant in the dacite except in the exposures of lot 32, range IX.

Metamorphosed Keewatin-type Rocks

In the vicinity of the batholithic or satellitic intrusive rocks, the Keewatin-type lavas have been intensely altered and metamorphosed but the type of

alteration varies somewhat depending upon the characteristics of the intrusive. Thus, in the northern half of the area, in the underground and surface workings of Vendome Mines Ltd., on lots 50 to 54, ranges VIII and IX, the alteration of the volcanic rocks near the Mogador stock and its related intrusions has been mostly one of replacement and of injection of acidic and carbonate material. On the other hand, in the southern half of the map-area and especially in the southwest quarter, the lavas have recrystallized into an amphibolite or an acidic biotite schist without introduction of foreign material.

Silicified Lavas and Injection Gneiss

As mentioned above, most of the silicified lavas crop out on lots 50 to 54, range X, and have been recognized in the underground workings and diamond drill cores of Vendome Mines Ltd. There are, however, small lithological and structural differences between the two localities.

In the Vendome Mines occurrence, the alteration consists of a progressive disappearance of the pillow and amygdaloidal structures through both silicification and recrystallization. The first stage is the development of brown patches and bands of chloritic and biotitic material which soon hide the primary structures of the lavas. Then follows the formation of either an irregularly banded rock made up of alternating purplish brown and green bands or of a sort of granular dioritic-looking material generally occurring as lenses in the banded rock. The final stage is the formation of an injection gneiss in which pinkish brown dykes of rhyolite intrude the silicified material. Exposures of this gneiss can be seen in the south half of lot 32, range IX, and a similar rock was located by diamond drilling at three other places in the northwest corner of the area. On lots 50 to 54, range X, 42 to 44, range VIII, and 43, range IX, the silicified material is of the dioritic type and consists mainly of a green dense, cherty rock with blue, oval quartz eyes and, here and there, feldspar crystals.

Amphibolite and Acidic Biotite Schist

The best exposures of the amphibolitic type of altered volcanic rock are in lot 47, about 1,000 feet north of the line between ranges V and VI. The rock is made up of fine- to coarse-grained hornblende with minor biotitic and chloritic material. It is dark green to black on fresh surfaces. Near small granite bodies, a little injection of aplitic material has taken place along the schistosity planes but the dykes die out within a few feet of the contact.

A schistose biotite-rich siliceous rock which crops out abundantly just south of the southeast quarter of the map-area extends northward into range VI, probably covering the southern parts of lots 53 to 59. Another occurrence of similar material can also be seen in the central part of lot 46, range VII.

The biotite schist is a fine grained, light coloured rock in which the alignment of the biotite-muscovite flakes cause a fairly well pronounced foliation. It also contains here and there small injections of fine grained albite granite. It is believed that this more acidic schist also represents a recrystallized lava but one that was originally more siliceous than those which were subsequently made into amphibolites.

INTRUSIVE ROCKS

Diorite and Quartz Diorite

Diorite and quartz diorite sills are believed to be the oldest intrusive masses of the area. They are undoubtedly more abundant than is shown on the accompanying map since a good number of them do not crop out as in the northwest corner where many were found through diamond drilling and in underground workings.

The best exposures of these rocks are found on lots 32, range IX, and lots 47 to 41, ranges VII and VIII. Two large sills and a group of smaller masses of similar composition were also outlined by mining exploration work in the westernmost third of range X.

The fresh rock is made up of a massive greyish green aggregate of light-coloured plagioclase and green ferromagnesian minerals in about equal proportions. A medium-grained texture is commonest in the westernmost occurrences and a grained gradation from fine to coarse can be seen in the exposures of lots 47 to 51, ranges VII and VIII. The coarser varieties weather rusty brown and the finer-grained facies have light brown to green surfaces.

Feldspar Porphyry

Two small dykes of feldspar porphyry were seen in the course of this survey in the southern part of lot 36, range IV, and a series of small dykes were also cut in diamond drilling elsewhere in the area, especially in the northwest corner. The rock is generally made up of feldspar porphyry laths up to $\frac{1}{4}$ inch long set in a schistose acidic matrix.

Albite Granite

Numerous small outcrops of albite granite occur to the east of the Val d'Or road, in ranges VI and VII. The scattered nature of the outcrops makes the shape of the granite body conjectural but it is probable that the main mass of the Pascalis-Tiblemont batholith, which crops out abundantly to the east of the present area, extends westward as far as the Val d'Or road. The granite is capped by varying thicknesses of amphibolite and it probably plunges gently to the west, thus following the regional trend of the folding.

The albite granite is medium grained and made up of quartz, plagioclase and small amounts of biotite. Weathered surfaces are white; fresh surfaces are light grey.

Intrusive Rhyolite

Intrusive rhyolite occurs in dykes, sills and injection gneiss at various places in the area but many occurrences are too small to be mapped separately. Intrusive rhyolite or felsite has been recognized as a facies of the Pascalis-Tiblemont batholith (5). The rhyolite of the northwest corner is most probably related to the granodiorite intrusions. In fact a gradation between rhyolite and granodiorite was seen in a drill hole along the line between lots 36 and 37, range X, 600 feet south of the northern limit of the area, and similar gradations are noted in com-

panies' drill logs for other holes. On the other hand, in the workings of Vendome Mines Ltd., a granodiorite dyke striking east of north seems to cut a series of rhyolite dykes but the contacts between the two types of rocks are not clear enough to give the same impression to all observers. It is suggested that the rhyolite and the granodiorite grade into each other as if they came from a common magma.

All the intrusive rhyolites of the area are very similar in appearance. Fresh surfaces are light brown with shades of pink, red and purple. Quartz eyes are usually visible but they are not present in all of the dykes; such is the case in the Vendome mine. However, similar dykes present in the Roymont deposit, about one mile to the west along the same strike, contain numerous bluish quartz eyes.

Of the few individual bodies of intrusive rhyolite which are large enough to be indicated on the map, one having a thickness of 50 feet is shown along the northern limit of the diorite in lot 32, range IX. North of it is a 300-foot-wide band of injection gneiss consisting of rhyolite dykelets and schistose lava in about equal proportions. Another small dyke is shown about 500 feet to the south.

Biotite-Hornblende Granodiorite, Hornblende Monzonite

Biotite-hornblende granodiorite and its associated hornblende monzonite crop out in the southwestern corner of the area and have been intersected by drilling and underground excavations or indicated by geophysical surveys in the western half of range X.

The southwestern area of this type of rock is considered as belonging to the Lacorne batholith more extensively exposed to the west and made up of a wide series of rocks varying from amphibolite to pegmatite (2). In lots 38, 39 and 42, range VII, rocks made up of at least 30 per cent hornblende with sodic and potassic feldspar and occasional quartz, thus having the composition of the Lacorne hornblende monzonite, crop out as dykes. In lot 32 of ranges VI and VII, the rock is more of the biotite-hornblende granodiorite variety with about 15 per cent hornblende, 4 per cent biotite and 15 per cent quartz.

A stock of biotite-hornblende granodiorite, named the Mogador stock, occurs along the northern boundary from lot 30 to 36, for a length of 8,000 feet and 2,000-foot width in its central part. It is a medium-grained rock corresponding to the Lacorne type of granodiorite except that red potash feldspar is nearly everywhere visible in drill cores. The amount of that feldspar varies from almost nothing to about 40 per cent. In the Vendome mine, a northeasterly striking granodiorite dyke occurring on the third level shows streaks and bands of red potash feldspar in a granular aggregate of hornblende, white feldspar and quartz.

The southern part of a plug-like body of a similar granodiorite has been cut by two drill holes in lots 41 and 42, range X, and its northern boundary has also been defined by geophysical means and the help of a small exposure on lot 44. Red potash feldspar is here also visible in the rock and, in the drill cores, medium-grained hornblende monzonite grades at depth into a rock made up of 90 per cent hornblende and 10 per cent feldspar.

Quartz Diabase

A Keweenawan-type quartz diabase crops out or has been recognized by magnetic surveys and drilling in the westernmost part of the area. The diabase forms a group of offset segments generally striking close to N.15°E.

STRUCTURAL GEOLOGY

Shape of Intrusive Masses

Rock exposures of the intrusive masses of the area are quite few and scattered, therefore the shape of the bodies must in large part be interpreted from results of magnetic surveys. The amount of magnetism present in granitic intrusives and lavas is about the same, but in the intrusives it is distributed haphazardly, whereas, in the lavas, it is concentrated in certain flows or along flow contacts. Magnetic contours over intrusives have random orientation and tend to be circular or slightly oval in shape. Over volcanic or sedimentary rocks, they have a tendency to parallel the strike of the flows or beds.

The Mogador stock is well outlined by ground magnetic surveys. The granodiorite sills, on the other hand, are not as definitely indicated. Intrusive-like anomalies over lavas are also produced by intense silicification or carbonatization both of which have the effect of distributing randomly the original magnetic minerals. Thus, the two bands of injection gneiss in lot 41, range X, produce magnetic anomalies similar to the ones of the plug-like body of hornblende monzonite occurring in the same lot. Also, some of the anomalies of the southern half of lots 44 to 47, range X, are apparently caused only by intense carbonatization of the lavas.

From the interpretation of aeromagnetic contours, Dawson (6) predicted a northeastward projection of the Lacorne batholith into the area, which would occupy the whole of ranges VI and VII, west of the Val d'Or road and a little beyond. In fact, this projection has been cut by drill holes on lots 34, 36 and 37, range VII. Two exposures of it were also seen in lot 32. It is probable that the Lacorne and Tiblemont batholiths are almost adjacent in the vicinity of the Val d'Or road.

Folding

The volcanic rocks strike from $S.75^{\circ}E.$ to $S.80^{\circ}E.$ throughout the central part of the area, that is roughly from lots 30 to 50. Good strike determinations were obtained from outcrops on lots 48 to 51, range VIII, and from drilling on lots 32 to 37, range X. To the east and west, the lavas usually strike about $S.60^{\circ}E.$ The orientation of the structure in the amphibolite schist of the southwest quarter of the area is quite variable.

A synclinal axis, fairly well defined in a group of exposures on lots 48 to 51, range VII, traverses the area in a direction slightly south of east. Two bands of dacite are there separated by basaltic flows. The similar appearance of those two dacitic bands is the best evidence available suggesting the presence of such a fold. Determinations of tops of lava flows are not too reliable because mild shearing has nearly everywhere schisted the borders of the pillows. The ones that are least open to question occur in the basalt area north of the postulated synclinal axis. Those of the north band of dacite are also fairly reliable, more so than in the south band where the evidence is rather weak. The general sequence of two dacitic bands separated by a basaltic suite is also found to the west of Laflamme river. The southern dacitic band appears there to be wider than its northern counterpart and this may be the result of a change in the strike to a southwesterly direction from lot 39 westward. The divergence of the dacite bands west of the Val d'Or road may be caused by a possible plunge of the syncline to the west, as is the case in other folds in Barraute and Lamorandière townships (7). The syncline is overtuned and its axial plane dips about 60 degrees north.

A possible anticlinal axis is also indicated by a few top determinations made in lots 48 to 51, range X. Another similar axis may run along the Pascalis-Tiblemont batholith, in ranges V and VI.

Shearing

Although strike shearing is the commonest movement in the area, there are also a few transverse zones of displacement such as on lots 51 to 54, range X. Rock exposures are there elongated in the direction of a series of northeasterly shears and, as is the case for the strike shears, silica, carbonate and intrusive material have accompanied or followed the shearing.

The locus of the above mentioned synclinal axis is a region of fairly widespread shearing. Small strike shears are especially abundant in the basalt immediately south of the axis, where they average one inch in width and five (5) feet in length. In the dacites, the shearing generally goes around the edges of the pillows.

The shear zones south of the Mogador stock are related to very siliceous bands up to 200 feet wide. Two main types of rocks are found in them; a massive greyish white rock with a porcellaneous lustre and a banded, grey and white rock of cherty appearance. Numerous intrusive rhyolite dykes are also present. The porcellaneous type and the banded cherty type grade into one another. The cherty type has been interpreted as a tuff but it is most probably the result of a silicification from closely spaced shears. The principal reason for this conclusion is that, in the Vendome mine, a shear zone passes gradually into a clean walled fault which is itself filled by a rhyolite dyke. The widths of the shear zones are also highly variable along strike.

Faulting

Two major faults are believed to intersect in the area but the absence of rock exposure along their postulated extension into the present area makes their location conjectural. They are the Manneville fault, considered as the eastern prolongation of the Porcupine-Destor fault, and the Laflamme fault. The Manneville break is a strike fault characterized by shear zones 50 to 200 feet wide of carbonatized or silicified schist. It is usually expressed topographically by valleys. The Laflamme fault cuts across the regional trend of the rock formations and is expressed topographically by a lineation extending through Fiedmont lake along the Laflamme river valley.

The nearest exposure of the Manneville fault is on the north shore of lake Roy, about five miles west of the present area (8). Assuming that the fault follows the regional trend of S.80°E, it should cut the line between ranges VIII and IX on lots 31 or 32 and intersect the Laflamme fault in the northern half of range VIII. No rock exposures occur on the immediate vicinity of this line but one hole drilled on lot 32, about 100 feet south of the range line,^x went through intensely crushed rock for a core length of 200 feet. In lot 32, range IX, there is an exposure showing a 300-foot-thick formation of injection gneiss made up of rhyolite dykelets in sheared lava. Along the same strike and farther west of the map-

x P.R. Geoffroy, personal communication.

area, albite granite, diorite and injection gneiss are exposed in the bed of Barraute creek. The multiple and successive intrusions over considerable widths suggest that they occupy a major shear zone.

The Laflamme fault has been cut by two drill holes in lots 41 and 42, range X, which went through intensely crushed hornblende monzonite. As the holes were put down almost parallel to the postulated strike of the fault, they gave no information as to its width or even its real orientation. Similar fault zones have also been cut along the Laflamme river valley in Barraute township^{xx} so there is not much doubt that a fault underlies the Fiedmont Lake - Laflamme topographical depression.

Economic Geology

Three types of metallic mineral deposits occur in the region: gold-bearing quartz veins; pyrrhotite-sphalerite-chalcopyrite replacement deposits with a low content of gold and pyrite-sphalerite deposits with a high tenor in gold. The quartz veins are usually associated with strike shears or faults and they occur in both volcanic and intrusive rocks. On the other hand, the host rocks of the pyrrhotite-bearing base metal deposits are generally limited to silicified lavas, whereas all the known pyrite-sphalerite-gold occurrences are located in the vicinity of the Pascalis-Tiblemont batholith with which they are genetically related.

Description of Mining Properties

Vendome Mines Limited

The property of Vendome Mines Limited comprises lots 31 to 39 and the north half of lot 40, range X, and the north half of lot 31, range IX. Its main deposit is on lots 33 and 34, range IX, and it has been opened up in the northern half of lot 34 by a 525-foot shaft and development work on three levels.

The country rock is a silicified and sheared andesite and the major structural controls of ore deposition are parallel shears and faults that dip steeply north or south and have widths up to at least 100 feet. Subsidiary first-lying shear zones branch off the main shears and commonly pass into a schistose injection gneiss.

The mineralization consists mostly of steeply dipping massive, lenticular pyrrhotite-pyrite bodies containing fairly regular zones of sphalerite. A little disseminated mineralization occurs outside the massive sulphide lenses in the silicified shears but almost none, in the silicified andesite. Chalcopyrite is erratically distributed in the lenses and is often found in small projections into the wall rock. Drilling below the third level has indicated that the tenor in chalcopyrite may increase with depth, whereas the amount of sphalerite seems to decrease.

Ore reserves above the third level are estimated at 1,121,000 tons averaging 7.3 per cent zinc, 0.47 per cent copper, 0.34 per cent lead, 1.63 ounces of silver and 0.034 ounce of gold per ton. Of this tonnage, 935,000 tons is proven by drifts and raises and 136,000 tons is listed as probable ore since it has been delimited only by diamond drilling. An additional 109,000 tons of possible ore containing about one per cent copper has also been indicated by drill holes below the third level.

xx T. Koulomzine, personal communication.

Barmont Mines Limited

The property of Barmont Mines Limited includes lots 32 to 38 and the south half of lot 31, range IX, and lots 31 to 37, range VIII. Vendome Mines Ltd. which has an option on part of Barmont's ground did most of the exploration work which consisted of at least 50 diamond-drill holes, which were put down between 1948 and 1957. The drilling revealed the presence in strike shears of some pyrrhotite with a little sphalerite and chalcopyrite. Some of these concentrations showed as anomalies on the magnetic map.

Malartic Gold Fields Limited

The mining claims of Malartic Gold Fields Limited cover lots 55 to 57, range VI, lots 53 to 55, range VII, and the south half of lots 57 and 58, range IX. In 1956 an electromagnetic survey was made on lots 48 to 51 and the north halves of lots 58 to 62, range VI. Two anomalies trending close to north were discovered on lots 55 and 57, about 2,500 feet south of the line between ranges VI and VII. Those anomalies were explored by packsack drill holes that went through granite and intrusive rhyolite and indicated no apparent reason for the presence of the anomalies. A total of 261 feet was drilled in 8 holes. The area is probably underlain by albite granite with, in places, remnants of amphibolitic rocks. In 1955 a geochemical survey was also carried out by soil sampling on lots 50 to 61, range VII. No anomalies judged worthy of investigation were found. Extensive outcrops in range VIII, close to the northwest corner of the company's ground, consist of dacite and diorite. The same rocks probably underly most of the Malartic Gold Fields property in range VII, with the exception of albite granite in the southwest corner.

Celta Development and Mining Limited

The company holds lots 41 and 42 in range X. Ten holes were drilled in 1952 to explore the vicinity of the Laflamme fault. Two holes intersected the fault but no metallic mineralization was found to be present in the fault breccia.

Valray Exploration Limited

This company owns the north halves of lots 47 to 50, range X. No exploration is recorded on behalf of the company for these claims, which are part of a block held in Barraute township.

Balaclan Mines Limited

This company formerly held lots 43 to 50, range X. A magnetometer survey was made on the claims which indicated the presence of several intrusive bodies in the south halves of lots 44 to 46. These bodies were explored by 6 drill holes in 1955 and one granodiorite sill was discovered. Other anomalies thought to represent intrusives turned out to be caused by the presence of highly carbonatized lavas. Shearing and carbonatization was widespread in all the lavas intersected in the drilling.

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