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NORTHWEST QUARTER OF FIEDMONT TOWNSHIP, ABITIBI-EAST COUNTIES

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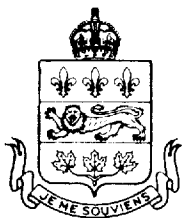
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GEOLOGICAL REPORT 108

**NORTHWEST QUARTER
of
FIEDMONT TOWNSHIP
ABITIBI-EAST COUNTY**

by

Richard E. Jones



QUEBEC
1964

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Map

No. 1489 - Northwest Quarter of Fiedmont Township (In pocket)

Northwest Quarter of Fiedmont Township

Abitibi-East County

by

Richard E. Jones

INTRODUCTION

General Statement

The northwest quarter of Fiedmont township, mapped during the summer of 1954 (1), lies within the Timiskaming sub-province of the Canadian Shield. The underlying formations are all Precambrian in age and consist of Keewatin-type lavas, intercalated sedimentary rocks and intrusions of gabbroic, dioritic and granitic rocks.

Numerous sulphide deposits, some of which contain zinc, copper, lead, and nickel, have been uncovered. Lithium has been found along the east edge of the Lacorne batholith.

Location

Fiedmont township lies along the south edge of the Barraute mining area and immediately east of the Lacorne lithium mining area in northwestern Quebec. The centre of the map sheet lies approximately at latitude 48°24' north and longitude 77°44' west.

Access

Travel facilities within the area are excellent. The town of Barraute, lying half a mile north of Fiedmont township, is accessible by good motor roads and by the Canadian National Railways from Val d'Or, Amos and Senneterre. Good gravel colonization roads cross the north part of the map-area and follow along its east edge. Travel away from the surfaced roads is facilitated by numerous bush roads and trails.

(1) The information has been brought to date as of 1961, particularly in respect to economic geology, by officers of the Department of Natural Resources, Quebec.

Field Work

Pace and compass traverses were used to locate outcrops on R.C.A.F. aerial photographs enlarged to a scale of approximately 1,000 feet to one inch. The map traced directly from the photographs was adjusted for scale to a base map provided by the Drafting Division of the Quebec Department of Mines. Additional information, obtained by plane table surveys along the road in the northern part of the area, was also used in adjusting the scale.

Every isolated outcrop was examined and the areas containing many outcrops were traversed at intervals of 400 to 500 feet.

Acknowledgements

Facilities to examine cores, maps and reports granted by mining companies are gratefully acknowledged. In particular, thanks for their cooperation are due to officers of Vendome Mines Ltd., Bar Metals Mines Ltd., Barvallee Mines Ltd. and Vallee Lithium Mining Corporation Ltd.

Mr. Guy Laroque, student at the University of Montreal, ably and conscientiously helped in running pace and compass traverses.

Previous Work

James and Mawdsley in 1926 and L.P. Tremblay in 1945 and 1946 mapped a large area which included the northwest quarter of Fiedmont township. These works were published by the Geological Survey of Canada as maps 206A and 999A, and Memoir 253.

W.G. Brown mapped the northeast quarter of Fiedmont township for the Quebec Department of Mines in 1957. This work was published as Preliminary Report No. 364, in 1958.

Description of the Area

Physiography

The northwest quarter of Fiedmont township can be divided into an eastern lowland area covered with clay, and a western highland area covered with sand and gravel.

Two prominent hills at the western end of ranges VIII and IX and a lower one at the western end of range VI dominate the map-area. A sand plain forms a level upland between these hills but slopes steeply at its eastern margin to the lower level of the clay plain which is about 100 feet lower.

Prevailing westerly winds have formed sand dunes on the clay to the east of the sand plain.

The highest hills are thickly covered with bush and little rock is exposed on the top, whereas rocks are abundant on their slopes and on both tops and sides of lower hills which extend towards the centre of the map-area. In the eastern part of the map-area a few knolls of rock or gravel constitute the highest parts of the glaciated area buried by clay.

All the drainage is to Fiedmont lake and thence to James bay by way of Laflamme, Bell and Nottaway rivers. In the clay plain, streams have cut youthful valleys, some of them being almost a hundred feet deep. Seepage from the higher sand plain provides most of the water for the streams. A sand and gravel esker oriented approximately north-south across the centre of the map-area has impeded drainage along its west side, forming extensive swamps.

The original forest cover has been cut or destroyed by fire. Sparse secondary poplar and jackpine now cover the sand plain in the western part of the area. Farming, particularly at the east end of ranges IX and X, has opened up large tracts of land. Many of these farms are now abandoned and are being reclaimed by forest growth.

GENERAL GEOLOGY

The rocks of the map-area are all Precambrian in age. These are made up of volcanic and sedimentary rocks intruded by bodies varying in composition from granite to gabbro. Less than 10 per cent of the map-area is rock outcropping. Glacial and post-glacial deposits of Pleistocene and Recent age cover the rest of the area.

The volcanic rocks are largely meta-andesites or metabasalts, either chloritized or amphibolitized. Siliceous lavas and pyroclastic rocks are common in the northeast part of the map-area. The sedimentary rocks are made up of conglomerates, greywackes and

minor quartzites, altered in places to biotite and sericite schists. The oldest intrusive rocks include lensoid bodies of peridotite and gabbro commonly conformable with the volcanic rocks. Quartz diorite bodies, possibly related to the gabbro, form sill-like masses. Dykes of porphyritic rhyolite, gabbro and diorite are in many cases feeders to overlying lavas. Later intrusive rocks related to the emplacement of the Lacorne batholith include granite, feldspar porphyry, pegmatite and aplite dykes, quartz veins, and the rocks of the batholith proper, hornblende monzonite, hornblende granodiorite and biotite granodiorite.

The following table of formations expresses as clearly as is known the relationship of the exposed rock types.

Keewatin-type Volcanic Rocks

Distribution

Intermediate to basic volcanic rocks altered to typical chloritic greenstone occur in very sparse outcrops in the northeast part of the map-area. In some diamond-drill cores and in outcrops along the bed of Barraute creek they are interbedded with rhyolite, dacite and siliceous pyroclastic rocks. Strikes are parallel to the regional trend of about N.70°W. These volcanic rocks belong to a belt of similar rocks passing westward through the area north of the Lacorne batholith. Tremblay (1950) traced this belt across Landrienne township into the belt of recognized Kinojevis volcanic rocks crossing the Lamotte map-area described by Norman (1944). The Kinojevis is probably the same as the Malartic group of volcanic rocks repeated by folding. These are the oldest known rocks of the map-area. They underlie the thick band of sedimentary rocks which lie near the west side of the area.

A second belt of basic to intermediate volcanic rocks occurs in the western part of the map-area. These rocks differ from those mentioned above for they have been recrystallized to amphibolite schists. However, scattered remnants of pillow structures and beds of tuff and agglomerate demonstrate the volcanic origin of these rocks. The higher degree of metamorphism is apparently due to the proximity of the Lacorne batholith. This belt of volcanic rocks is separated from the first one by a zone of sedimentary rocks up to 4,000 feet wide, which it overlies. This second belt of volcanic rock could by definition be equivalent to the Blake River group of Gunning and Ambrose (1940). The best exposures of the amphibolitized volcanic

TABLE OF FORMATIONS

Era	Period	Group	
	Recent		Unconsolidated stream, swamp and organic accumulations
	Pleistocene		Moraine, esker and glacial lake deposits of unconsolidated gravel, sand and clay
Unconformity			
Late Precambrian	Keweenaw-type		Diabase
Intrusive contact			
Early Precambrian (Archean)			Quartz veins, pegmatite, aplite, granite and feldspar porphyry dykes. Hornblende monzonite, hornblende granodiorite and biotite granodiorite of the Lacorne batholith
		Intrusive contact and period of major folding	
		(1)	Albite granite?, granodiorite. Quartz porphyry. Quartz diorite, gabbro, amphibolite and peridotite
		Intrusive contact	
		Keewatin-type	
		Conglomerates, greywackes and derived biotite schists. Minor quartzites and amphibolites	
	Kinojevis Group		Siliceous and mafic lavas, tuffs, agglomerates and tuffaceous sedimentary rocks. Basalt, andesite, dacite, rhyolite, trachyte

(1) Some of the intrusives in this group may be contemporaneous with vulcanism.

rocks are around and between the two hills on lots 1 to 8 in ranges VIII to X, and they continue westward beyond the map-area across Lacorne township in the area north of Roy lake.

Lithology

The volcanic rocks of the northeast corner of the map-area are fine-grained, grey-green weathering chloritic schists showing smooth surfaces. These rocks were probably originally of andesitic composition. Epidotized patches with ladder system fractures are sparse. A few amygdule-like cavities contain pyrite. Rhyolitic and dacitic lavas are intercalated with the andesitic rocks. The rhyolites are commonly porphyritic and, where massive, have been called quartz rhyolite porphyries. They exhibit rough pillow structures in places, proving that they are mostly of volcanic origin. The dacites are soft, light grey-green rocks commonly amygdular. They have been noted only in diamond-drill cores.

Hornblende is the chief mineral of all the volcanic rocks in the western part of the map-area. The fine-grained, hard and dense aspect of these rocks and their blue-grey or black colour suggest that they are basalts. They have been so thoroughly altered that no precise classification of the original composition can be attempted. The grain size becomes coarser close to the contact with the batholith so that on lots 13 and 14 in range VII a medium-grained, light blue-grey to dark grey amphibolite gneiss lies within 200 feet of the contact. A foliation apparently parallel to the contact of the batholith may represent the original bedding of tuff or may be a metamorphic differentiation influenced by shearing along the contact.

Actinolitic hornblende is seen in thin section to be the dominant mineral of the amphibolitized volcanic rocks two to three thousand feet from the contact of the batholith. It has a small extinction angle and pleochroic colours X pale yellow, Y drab green and Z green, with absorption formula $X < Y < Z$. Most of the tiny shreds of amphibole are aligned and equigranular feldspar fills the interstices. Zoisite and epidote are fairly common. Quartz and biotite associated with epidote are more common in some bands. Opaque minerals are rare.

Nearer the contact, the feldspar, which appears to be oligoclase, increases in abundance to as much as 70 per cent of the rock. Hornblende here closely resembles that of the batholith in both

extinction angle and colours, being X pale brown, Y dark brownish green, almost black, and Z dark bluish green. Epidote and zoisite are absent in rocks near the contact yet biotite is more abundant than in the rock farther away.

Tuff beds 4 feet to 800 feet wide have a fine lamination with alternate black and white beds a fraction of an inch thick; the lamination is parallel to the schistosity. Agglomerate beds up to 15 feet thick contain bombs and lapilli generally a few inches across. At one place in lot 8, range VIII, bombs are as much as two feet across. The fragments are oval in outline and elongated parallel to the schistosity. They weather pale green and stand above the matrix on weathered surfaces.

Sedimentary Rocks

Distribution

Conglomerates and greywackes largely altered to quartz biotite schists are exposed over a maximum width of 4,000 feet in the western part of the map-area. These cover large parts of lots 5 to 9 in range X, lots 7 to 11 in range IX, and lots 7 to 13 in range VIII. There are a few scattered outcrops in ranges VI and VII to the southeast of the large outcrop area.

A band of conglomerate with a maximum width of 700 feet is exposed along the east edge of the zone of sedimentary rocks. Other conglomerates form narrow lenticular bodies within the greywackes in the centre of the zone. Conglomerates are numerous along the west edge of the sedimentary band and particularly in the northwest part of the zone where they predominate over the greywackes.

Narrow bands of quartzite commonly associated with pyrite and pyrrhotite are located within the greywackes and tuffaceous sedimentary rocks particularly in the west part of the sedimentary zone.

Lithology

The conglomerates along the east edge of the sedimentary zone are composed of rounded, elliptical, subangular and angular granules, pebbles and cobbles of quartz, granite, chert and siliceous and basic volcanic rocks. They lie in a matrix of greywacke. In lot 11, range IX, the conglomerate at the east edge of the sedimentary zone is

made up mostly of fine-grained, light pink to light brown, well-rounded rhyolitic pebbles with a lesser number of pebbles of quartz and biotite granite gneiss. The largest cobbles are medium-grained biotite granite 9 inches to one foot across and white quartz up to 10 inches across.

Table 1

Pebble Count of Conglomerate in Lot 11, Range IX

Rock in pebble	No. of pebbles,	Size range
Fine-grained light pink rhyolite	21	1/2" to 3"
Fine-grained white to grey quartz	5	1/2" to 2"
Dark fine-grained biotite gneiss	3	1/2" to 2"
Fine-grained biotite granite gneiss	2	1" to 2"
Medium-grained soft biotite gneiss	1	1 1/2" to 4"

Width of bed 2', well crowded with pebbles.
Count on two traverses 8" apart.

These conglomerates along the east edge of the sedimentary band are possibly basal conglomerates because of their position at the base of the sedimentary sequence and the predominance of volcanic and granitic fragments.

The conglomerates within the greywacke band and along the west edge of the sedimentary zone are possibly intraformational conglomerates. They are made up of angular to subangular fragments of chert, carbonate, argillite, graphitic slate and greywacke. They are interbedded with greywackes. These conglomerates are particularly highly deformed and schisted at the northwest end of the zone. This deformation could be partly primary and due to slumping of the sediments during deposition (penecontemporaneous).

The greywackes are massive to well laminated, medium- to fine-grained, dark grey rocks weathering grey to brown. They are altered rocks now largely composed of quartz and feldspar with interstitial biotite, sericite and chlorite. Some of the feldspar is albite and some oligoclase. Oligoclase forms as much as 15 per cent of the rock in one specimen. All outcrops show some degree of schistosity which is well developed near the margin of the Lacorne mass. Schistosity generally strikes south of east but locally is much contorted. Flakes of biotite and sericite aligned with the schistosity give a sheen to broken fragments.

In a few places bedding is well shown as a result of interlaminated, more massive, sandy beds one to 2 inches wide, and well schisted and knotted fine-grained beds 3 to 4 inches wide. In other places, sandy beds and beds of conglomerate are a few feet wide. Commonly, however, bedding can hardly be distinguished, partly as a result of deformation. Bedding strikes north to northwest and generally dips from 90° to 40° E.

Vague cross-bedding, indicating tops to the west, was seen at one place just west of the conglomerate in range VIII. The beds strike $N.10^{\circ}$ W., are vertical or slightly overturned, and transected by schistosity which strikes $N.75^{\circ}$ E. and dips 50° N.

In the northern part of lot 7, range X, a 3-foot-thick bed grades from a granule conglomerate along the east edge through greywacke and a schisted argillitic top at the west end. The bed has a strike of $N.20-30^{\circ}$ W. and dips 60° E.; thus, the top of the bed faces west and is overturned.

Quartzite in narrow bands can be found on the west edge of the sedimentary belt in ranges VII, VIII and X. The quartzite is interbedded with biotite schist derived from greywacke and thin beds of amphibolite. Pyrite and pyrrhotite are found as disseminations, streaks and blobs in the quartzitic rocks. The quartzites, greywackes and amphibolites in the section close to the batholithic rocks in ranges VII and VIII are well banded with beds a fraction of an inch to several feet in thickness. They have been severely sheared, drag folded and altered.

The amphibolite is found predominantly near the batholith contact where it occurs as beds up to 2 or 3 feet thick. Elsewhere, and particularly where it is interbedded with quartzite, the beds may be a few inches or less in thickness. In the contact zone some of the beds in the sedimentary rocks may be volcanic in origin but they are now biotite-chlorite-hornblende gneisses and schists, except for at least one narrow band made up of siliceous volcanic breccia.

Intrusive Rocks

General Distribution

Intrusive rocks as sills, dykes and irregular masses are found almost everywhere intruding the volcanic and sedimentary rocks. Some of these are contemporaneous with vulcanism; others are younger. The southwest corner of the map-area is underlain by granodiorite and monzonite rocks of the Lacorne batholith which occupy large areas of Lacorne, Vassan and Senneville townships to the west and to the south of the map-area.

Peridotite

A mass of altered peridotite enters the map-area at the north end of lot 1, range IX, swings sharply to the south through lot 2, crosses the south end of the range in lot 3 and dies out at the north end of lot 4, range VIII. This sill-like body is at least 600 feet wide.

The peridotite is a massive dark bluish rock, apparently very fine-grained and completely altered to secondary minerals, generally serpentine, actinolite-tremolite and talc. Weathered surfaces are white to light grey where they are dry and brown where they are damp beneath moss. The rock is very soft and, where talc is present, slippery to the feel. In places near a granitic dyke, tremolite has developed as white acicular crystals aligned to give a faint foliation parallel to the dyke.

Peridotite cuts the volcanic rocks and is therefore younger. It is considered to be the oldest intrusive rock in the Keewatin lavas, and may be contemporaneous with overlying vulcanism. A granite dyke, probably related to the Lacorne batholith has cut and altered the peridotite.

Metaqabbro or amphibolite

Coarse-grained rocks composed largely of hornblende intrude the volcanic rocks. The largest area of these occurs on an isolated knoll on lots 21 to 23, range VI. Small outcrops of amphibolitized volcanic rocks low down the flank of the knoll suggest that the amphibolite is intrusive into the volcanic rocks.

Sills of amphibolite generally concordant with the flows range in width from about 10 feet to over 200 feet and occur in several places in the amphibolitized volcanic rocks in the western part of the map-area. Locally the amphibolite includes slabs of tuff, and in some places the contact of the amphibolite crosses the bedding of the tuff, showing the intrusive nature of the amphibolite. Rock similar to the amphibolite in appearance is found as a three-foot dyke in conglomerate in lot 12, range VII. This rock is, however, composed largely of chlorite. Amphibolite is in contact with volcanic rocks on lots 12 and 13, range VIII, to the east of the belt of sedimentary rocks. It exhibits a chilled margin 3 or 4 feet wide and a diabasic texture.

The weathered surface of the amphibolite is commonly dark greenish grey and knobby in appearance. The knobs are hornblende crystals or clumps of chlorite derived from hornblende. The rock is massive and coarse grained with hornblende metacrysts ranging in size from 2 to 3 mm. across, 3 to 4 mm. wide and 6 to 7 mm. long. Generally there is no preferred orientation of the hornblende metacrysts. An exception is the large outcrops on lots 21 to 23, range VI, where large hornblende crystals 2 to 3 mm. wide and 6 to 7 mm. long are aligned to give a faintly foliated structure. Here, fresh-looking black hornblende makes up 70 per cent of the rock; the remainder is finer-grained dull feldspar interstitial to the hornblende. In the northwestern part of the map-area the hornblende of the amphibolite is duller, partly altered to chlorite, and forms 90 per cent of the rock.

Dark grey fine-grained dykes or sills of basic intrusive a few inches to a foot or so wide occur at a few widely separated places within the sedimentary rocks. Most of these are dark grey amphibolites composed of feathery amphibole, some biotite, feldspar and quartz. A larger area of similar rocks occurs near the north end of lot 10, range VIII. They may be altered diabases.

In thin section the amphibolite is seen to be composed of 70 to 90 per cent amphibole, most of it in very large ragged grains but with some as fine prismatic needles in the matrix of feldspar and quartz. The amphibole is green and pleochroic with X pale brown, Y green to brownish green and Z green to blue-green, the absorption formula being $X < Y < Z$. Chlorite occurs around the edges of these grains in some places. Fine-grained quartz is the most abundant mineral in the matrix, but is accompanied by albite, small needles of amphibole, epidote, zoisite, a few scattered grains of apatite and opaque minerals.

Many of the large grains of amphibole show bent cleavages and some are broken and veined with the material of the matrix. Schistosity in the matrix, outlined by the needles of amphibole, bends around the large grains.

The amphibolite is probably an altered gabbro intrusive into the volcanic rocks. It is similar in mineralogy to the enclosing rocks and may have been intruded into them from the same magmatic chamber. Some of these intrusives may have been feeders to the overlying lavas. Shearing and metamorphism have, however, obliterated the original texture and mineralogy, making interpretation of their origin difficult.

Quartz Diorite and Diorite

The largest outcrop of quartz diorite is on the eastern limit of the map-area in lot 31, range IX. Some small outcrops occur in the bed of Barraute creek in lots 21, 22 and 30, range IX. Coarse diorite is reported from a number of drill holes in the northeast corner of the area. In the centre of lot 7, range X, two diorite dykes cut across the greywackes.

Most of the quartz diorite and diorite is much altered. It is a slightly schistose medium- to fine-grained rock weathering grey. It is made up of dull grey-green feldspar, chlorite, biotite, amphibole and a little quartz. The outcrop in lot 31, range IX, shows along its south edge a weathered surface with a knobby texture similar to the amphibolite. The knobs are composed of chlorite pseudomorphs after amphibole. The dykes in lot 7, range X, strike approximately north and dip to the east. They are 8 and 3 feet wide, the latter showing a chilled edge. The diorite is dark grey with grey feldspar, biotite, fine disseminated pyrrhotite and, possibly, small needles of greenish amphibole.

In thin section some of these rocks show remnants of subhedral grains of polysynthetically twinned feldspar almost obliterated by alteration to fine-grained sericite and zoisite or epidote. The feldspar is enclosed in a fine-grained matrix of chlorite, feldspar and quartz. In some cases chlorite is associated with very pale green amphibole with low extinction angle. Quartz occurs in clear grains of medium size and in clusters of smaller grains; it appears to be secondary. Carbonate occurs abundantly in the quartz diorite at the northern limit of the map-area.

Some of these rocks might be the result of low-grade metamorphism of gabbro similar to that which gave rise to amphibolite under the influence of heat from the Lacorne batholith. The quartz diorite and diorite were intruded into the volcanic rocks and to a much lesser extent into the sedimentary rocks as sills and dykes closely related to the gabbro-amphibolite. They possibly originated from the same magma which in turn was closely related to the volcanism. Some of these bodies may be coarse flows and feeders to overlying lavas.

Intrusive Rhyolite

A few very small dykes of felsite or rhyolite, up to 3 feet wide, are found in the volcanic rocks and in the amphibolite. A common type is a fine-grained pink rock weathering pale brown. It is porphyritic with rectangular feldspar phenocrysts about one mm. across. These dykes are composed largely of feldspar and quartz with a few thin needles of amphibole or flakes of biotite up to one mm. in length which gives rise to a faint foliation parallel to the walls. This rock is similar to the fine-grained pink rhyolite found as pebbles in the conglomerate. Dykes of intrusive rhyolite occur in amphibolite and lavas in lots 13 and 14, range VIII, and at the north end of lots 4 to 6, range VIII. These rocks resemble the pillowed rhyolites found along the creek bed from lots 21 to 31, range IX, and are probably feeders related to volcanism.

Albite Granite

A small area of albite granite occurs in lots 26 and 27, range IX. It is a medium-grained massive rock composed of quartz, feldspar and chlorite. Scattered pyrite occurs in cubic crystals. The feldspar is mostly albite (An_4) although a few small grains with simple twins may be orthoclase. Albite occurs as elongated subhedral grains clouded with much sericite, some of the grains being bent. Quartz forms large, clear, rounded grains some of which apparently replace albite. Chlorite, locally associated with large flakes of white mica, is interstitial.

This albite granite may be related to a similar granite occurring to the south around Fiedmont lake, and in lots 30 and 31, range VII. Tremblay (1950) thinks it is a cupola of the Pascalis-Tiblemont mass to the east.

Subsequent diamond drilling and geophysical data have shown that the albite granite forms the siliceous core of an intrusive complex made up of granite, granodiorite, quartz diorite, quartz gabbro, amphibolite and peridotite. Magmatic segregation by gravity separation and crystal settling has formed a roughly layered complex. The most basic member of the complex, the peridotite, lies at the base of the intrusive mass. The mass would appear to plunge to the southeast, and the northwest part of the complex, where the peridotite is located, would represent the bottom.

Lacorne Batholith

Hornblende monzonite, hornblende granodiorite and biotite-hornblende granodiorite occur in sparse outcrops in the southwest quarter of the map-area showing that a portion of the Lacorne batholith lies here. The contact of the Lacorne mass with the volcanic and sedimentary rocks may be traced along a line trending about S.45°E. from the south end of lot 1, range IX, to the south end of lot 22, range VI. This contact is exposed at many places on lots 10 to 13, ranges VII and VIII. Rocks of the Lacorne batholith are presumed to underlie the whole of the map-area south and west of this line.

Hornblende monzonite is exposed in two places in the southwest corner of the map-area, some two miles from the contact: one in lots 1 and 2, ranges VI and VII, and the other in lot 5, range VI. The hornblende granodiorite outcrops in lots 13 to 18, range VI, are closer to the contact and biotite granodiorite containing some hornblende outcrops along the edge of the batholith contact in lots 7 to 11, range VIII; lots 11 to 14, range VII; lot 21, range VI; and in drill holes at the south end of lot 1, range IX.

Hornblende monzonite and hornblende granodiorite are similar in texture and general appearance in the field and can only be distinguished by the small amount of quartz in, and slightly finer grain of, the granodiorite as compared to the monzonite. Quartz appears to increase in amount towards the contact of the batholith so that granodiorite is recognized about a mile from the contact. A few hundred feet from the contact, biotite becomes at least as abundant as hornblende; at the contact, biotite predominates and the rock is a biotite granodiorite.

All of these rocks, with the exception of the biotite granodiorite, are coarse to medium grained, faintly pink to grey in colour on fresh surfaces and weather light grey. A deeper pink colour is apparent near joints. Hypidiomorphic crystals of oligoclase 2 to 3 mm. across, some of which are pink, constitute up to 50 per cent of the rock, and finer-grained white interstitial feldspar adds 20 per cent to the feldspar content. Black glistening elongated hornblende crystals of various sizes up to 5 mm. long and 2 mm. wide are interstitial to the large feldspar crystals and form about 20 per cent of the rock. Grains of light brown sphene, many of which appear elliptical in outline, are common. Pyrite is a rare accessory mineral.

Some of the larger feldspar crystals are rectangular in shape; some are elongated and slightly aligned, suggesting a slightly porphyritic and trachytic texture. Clusters of hornblende crystals are also rudely aligned to give a faint discontinuous vague foliation on outcrop surfaces. Vertical surfaces of sufficient extent could not be found to determine lineation except at one place in lot 14, range VI, where a plunge of 40° east was observed. The strike of foliation is east at the western limit of the map-area but swings to $S.55^{\circ}E$. farther east where the lineation was observed.

A change in texture takes place with the increase of biotite at the contact where the rock becomes distinctly foliated parallel to the foliation of the enclosing volcanic and sedimentary rocks. Feldspar grains show on weathered surfaces as ellipses 2 to 3 mm. long, resembling augen, with long axes parallel to the foliation. Flakes of biotite with interstitial quartz lie around the feldspar grains suggesting that shearing may be the cause of the texture.

Hornblende monzonite and hornblende granodiorite are also similar in appearance in thin section, except that quartz is rarely found in the monzonite, whereas it makes up at least 10 per cent of the latter. The texture is hypidiomorphic-granular with subhedral crystals of plagioclase partly replaced by anhedral interstitial potash feldspar. In both rocks, feldspar of three varieties is the chief constituent and hornblende, the varietal constituent. Accessory minerals in both rocks are sphene, apatite, zircon, and opaque minerals, and the alteration products are epidote, zoisite and sericite. Epidote, however, occurs in much larger quantity in the hornblende granodiorite, indicating greater alteration.

The three varieties of feldspar are oligoclase, albite and microcline. Oligoclase ($Ab_{83}An_{17}$) occurs in large subhedral grains clouded with epidote and sericite. Polysynthetic twinning and simple zoning characterize these grains, many of which retain their rectangular outline despite irregular borders to the interstitial microcline. Clear albite, lacking both inclusions and twinning, rims many of the grains of oligoclase for a distance of as much as one-third of the way towards the centre. Some of the albite occurs amongst fine-grained sericite and zoisite apparently left from earlier oligoclase. In general, the texture suggests that albite replaces the oligoclase completely in some grains and only partly in others where it forms a rim. Some of this albite is antiperthitic.

Fine-grained microcline and albite, together with quartz in the granodiorite, form an interlocking mosaic between the large crystals of feldspar and hornblende, apparently partly replacing these along irregular borders. Microcline is characteristically twinned and albite is polysynthetically twinned. A stained polished section shows that most of the interstitial feldspar is potassic, whereas most of the subhedral grains are not. A few large rectangular grains, however, are shown to be potassic.

Hornblende occurs as large elongated grains, a few of which show good prismatic outline. Most of the grains are ragged in outline not only against the later matrix feldspar but also against the oligoclase. Hornblende tends to occur in clusters of crystals but no orientation of the elongated crystals is apparent in thin section. The hornblende is green and pleochroic, X pale brownish green, Y very dark dirty green, almost black, and Z deep clear bluish green, the absorption formula being $X < Z < Y$. Some grains are simply twinned parallel to the prismatic zone.

Sphene, both as well formed crystals and smaller ragged crystals, is a notable accessory of both rocks. Apatite and zircon are sparse and occur as small euhedral crystals enclosed in both hornblende and feldspar.

Epidote or zoisite is widespread, being associated with both altered oligoclase and hornblende. Coarse-grained epidote associated with hornblende is pale yellow in colour and slightly pleochroic. It is particularly common in the hornblende granodiorite probably as the result of greater alteration of hornblende. Tiny

needles of rutile associated with this epidote might have formed from titanium freed from hornblende during alteration suggesting that the original hornblende was titaniferous.

Biotite granodiorite as seen in thin section differs from the above monzonite and granodiorite both in mineralogy and texture. The large grains of oligoclase altered largely to sericite and zoisite or epidote are recognizable, but they are bent, broken and shredded as a result of movement. Fragments of zoned crystals broken across the zoning are found isolated in the matrix; one fragment of such was seen to be completely enclosed in a large grain of quartz suggesting that the quartz is a later replacement. Microcline and albite are absent and quartz is far more abundant in the interstitial material of this contact phase. Some of the quartz grains are as large as the oligoclase and show strain shadows. Flakes of green and brown biotite amongst the fine-grained quartz indicate schistosity bending around grains of oligoclase, further evidence of movement. Sphene is rare and epidote is not so abundant as in the hornblende granodiorite.

Inclusions in the Lacorne Batholith

Inclusions of volcanic and sedimentary rocks varying from the size of pebbles to large slabs several hundred feet long and up to 50 feet wide occur in many places in the Lacorne mass. Most of the small inclusions are elliptical in shape on outcrop surfaces and aligned parallel to the faint foliation. Some are dark-coloured schlieren with vague borders; others have sharp outlines, are also dark in colour and are composed largely of fine-grained amphibole undoubtedly derived from the enclosing recrystallized volcanic rocks. Near the west limit of the map-area in lot 1, range VI, there is an inclusion of conglomerate about 7 feet long by 6 feet wide. The conglomerate contains pebbles of granite two or three inches across. A small inclusion composed entirely of dark green actinolite enclosed in biotite granodiorite in lot 10, range VIII, may be altered peridotite.

The largest inclusions occur in hornblende granodiorite in lot 16, range VI, at the south limit of the map-area. These two parallel slabs of biotite schist are two to three hundred feet long and dip 80° to the northeast. The granodiorite between the slabs is veined with quartz, and pyrite is plentiful along the northeastern margin of the schist.

Other possible inclusions of volcanic rocks are exposed in lot 13, range VI, and lot 13, range VII, but the second of these may be a large boulder.

Contact Zone of the Batholith

The contact zone of the batholith with the enclosing rocks is about one hundred feet wide. In this zone large slabs of wall rock 20 to 30 feet long and 10 to 15 feet wide are enclosed in the batholith, and dykes of biotite granodiorite 10 to 20 feet wide cut the wall rocks parallel to the contact. Locally the contact is irregular and abruptly transects the schistosity.

In lot 11 on the line between ranges VII and VIII, a fine-grained felsite dyke about 3 feet wide occurs at the contact. Inclusions of a similar felsite found in the batholith less than 2,000 feet west of the dyke suggest that the dyke was intruded into the schist prior to the intrusion of the batholith and by chance is locally found at the contact.

Generally there is no chilling at the border of the batholith. The grain size of the feldspars remains coarse right up to the contact, which is so sharp that a specimen will split apart along the contact. Elliptical feldspar grains become less densely packed within a foot or so of the contact with a consequent increase in the amount of interstitial biotite and quartz. Biotite granodiorite outcropping in lot 21, range VI, has this texture and is therefore presumably very close to the contact of the batholith.

The batholithic rocks are later than both the volcanic and sedimentary rocks, for the contact relationships and inclusions are proof of its intrusive character.

Hornblendite Dyke in the Batholith

Two parallel dykes of hornblendite up to 10 feet wide, and 10 or 20 feet apart, striking N.55°W. are intrusive into hornblende monzonite on lot 5, range VI. Phenocrysts of white feldspar are scattered in a matrix of dark green chloritic amphibole giving a distinctly spotted appearance to the rock. In thin section some of the feldspar is seen to be zoned but most of it is clear albite. Medium-grained interlocked crystals of amphibole similar to that of the monzonite surround the feldspar. Sphene is accessory and epidote is an alteration product associated with hornblende. The hornblendite cuts a narrow dyke of pegmatite offsetting it 6 inches to the left; dragging of the offset dyke indicates plastic flow of pegmatite and the enclosing monzonite. The hornblendite is probably a late diastrophic dyke, later than the pegmatite, but intruded while the main mass of igneous rock was still slightly plastic.

Diabase Dyke

A diabase dyke, about 20 feet wide, striking south-southeast and dipping 70° east, is exposed in the northwest corner of lot 31, range VII. The dyke shows fine-grained chilled contact zones against the volcanic rocks and apparently cuts a small feldspar porphyry dyke, although contacts are covered. The diabase is fine grained and weathers black. It is well jointed both parallel and perpendicular to the walls. It is probably related to the larger dyke which occurs just beyond the eastern limit of the map-area.

STRUCTURAL GEOLOGY

Major Folding

Four top determinations, from observations on grain gradation and cross bedding in the zone of sedimentary rocks on the west side of the map-area, suggest that these rocks face west. They dip east and are therefore overturned. The basal conglomerate along the east edge of the sedimentary zone also suggests that these face to the west. Two top determinations in the volcanic rocks west of the sedimentary rocks, one from pillows and the other from flow top breccia also suggest that these face west. They also dip east and are thus overturned. To the west in Lacorne township, Latulippe (1953) and Tremblay (1950) also report the same attitude. The amphibolitized volcanic rocks along the contact of the Lacorne batholith are therefore younger than the sedimentary rocks. These volcanic and sedimentary rocks are part of the west limb of an anticline whose axis lies to the east.

Outcrops of siliceous volcanic rocks, in the bed of Barraute creek in range IX, are pillowed in two places and show that these lavas face to the northeast. There appears to be an anticlinal axis between this area and the zone of sedimentary rocks to the west. This axis strikes in a northwesterly direction and is aligned with an axis indicated in the southeast quarter of Fiedmont township by Van Loan (1959). In the northeast quarter of Fiedmont township, Brown (1958) indicated a synclinal axis running across range VIII in a N.75°W. direction. With a slight swing to the north this synclinal axis would cross into the northwest quarter of the township in about the centre of range IX and continue in a northwesterly direction to pass out of the map-area east of the outcrops on the township line in lot 20. Brown (1958) shows a short anticlinal axis in the north part

of lots 50 to 55, range X, Fiedmont township. If this fold axis continues to the west it should pass through the Mogador plug. It is a fold complementary to the major synclines to the north in the south half of Barraute township, and to the south in the north half of Fiedmont township.

Fold axes in the Amos-Barraute area, north of the map-area, are located at intervals of about 4 miles. The fold axes in Fiedmont township are 2 miles or less apart. This may be explained by the closeness of the Lacorne and Pascalis-Tiblemont batholiths.

Cross Folding

Tuffs are in contact with biotite schist of sedimentary origin at many places in lots 6 to 10, range VIII. The contacts are sharp, the quartz biotite schist giving way abruptly to laminated amphibole schist, but the relationship in general is exceedingly complicated. The sharp contacts suggest interbedded pyroclastic and clastic sediments with abrupt changes in deposition. The complexity of the contact with inter fingering of volcanic and sedimentary rocks, and the variety in strikes in this locality suggest a large overturned drag fold or cross fold plunging slightly east of north, the south side dragged west with respect to the north side. Near the contact of the batholith, schistosity is tightly crumpled into small chevron folds 3 or 4 inches across. Horizontal traces of the axial planes of these folds strike N.50-60°E. but the axial lines plunge 55° towards the north giving a lineation roughly parallel to the elongation of the pebbles in the conglomerate. These small drag folds appear to be related to the larger cross fold and have a similar attitude.

Structural and Age Relationships of the Volcanic and Sedimentary Rocks

The sedimentary rocks in Fiedmont township are, from the evidence available, underlain and overlain by volcanic rocks. The underlying volcanic rocks are Kinojevis in age (Tremblay 1950). If the overlying volcanic rocks are also considered to be Kinojevis in age, the sedimentary rocks represent a large but local interval of sedimentation during Kinojevis volcanism. If the sedimentary rocks are Kewagama in age (Tremblay 1950) the overlying volcanic rocks are possibly the equivalent of the Blake River group in Malartic township (Gunning and Ambrose 1940).

A wide sand ridge covers the northwest continuation of the sedimentary rocks in Landrienne township. These rocks either end under the sand plain or they continue to the west where they have been mapped as a thick group of pyroclastic rocks with some fine clastic sedimentary rocks. In the southwest part of Landrienne township and in the south half of Figuery township the formations face south and appear to be part of the south limb of the Amos anticline. From the known structural data it would appear that the Fiedmont sedimentary zone is stratigraphically below the Kewagama sedimentary rocks and the zone of amphibolitic lavas located along the north edge of the Lamotte and Lacorne batholiths. Thus, it is tentatively best to consider the Fiedmont sedimentary rocks as a sedimentary interval during Kinojevis vulcanism.

Faulting

The eastern extension of the Manneville fault has been followed by Latulippe (1953) to the east limit of Lacorne township. The fault enters the map-area along the creek bed at the north end of range IX, and may pass out of it at the north end of lot 31, range VIII. Drilling at the north end of lot 32, range VIII, showed intensely crushed rock for a core length of 200 feet (Brown 1958). This shear zone could be the extension of the Manneville fault to the east.

There are numerous cross faults striking in a northeast direction. These show offsets of north side east, though a few have a reverse offset. These faults are probably everywhere present in the map-area. They show up particularly well in the zone of sedimentary and volcanic rocks along the edge of the Lacorne batholith because this zone is well exposed and has many good marker bands. Since these faults cut across the batholithic rocks as well as the volcanic and sedimentary rocks they are late in the geological sequence of events.

ECONOMIC GEOLOGY

General Statement

The geology of the northwest quarter of Fiedmont township is favourable for deposits of copper, zinc, lead, gold, silver, lithium, molybdenum and nickel.

The copper-zinc deposit of Barvallee Mines is located at the north end of lots 28 and 29, range X. It is in the same general zone as the Vendome (Mogador) deposit in lots 33 and 34, range X, and the Belfort (Roymont) deposit at the south end of lot 28, range I, Barraute township.

Chalcopyrite in very small amounts was found in siliceous volcanic rocks in two places along Barraute creek, one in an outcrop in lot 31, range VIII, Fiedmont township.

Pyrite and pyrrhotite are found as disseminations, streaks and pods in narrow quartzite bands along the west edge of the sedimentary rocks in ranges VII, VIII and X. A few rock trenches were put down into these sulphide masses. They appear to be barren of gold, copper and zinc. They probably have a sedimentary origin.

Lithium-bearing pegmatite dykes were cut in diamond drilling at the south end of lot 1, range IX, on the property of Vallee Lithium Mining Corporation. In the area to the west, pegmatite dykes are being mined for their lithium content by Quebec Lithium Corporation along the contact zone of the Lacorne batholith. The contact zone of the batholith in Fiedmont township is favourable for finding more lithium-bearing pegmatite dykes.

A two-foot quartz vein with streaks of fine-grained molybdenite was cut in a diamond-drill hole in greywacke in lot 7, range IX, Fiedmont township. Molybdenite has also been discovered to the west in lot 59, range IX, Lacorne township, and in at least 8 locations in the south half of Fiedmont township. (Van Loan 1959 and Tremblay 1950)

Mineralized Float

Many floats mineralized with zinc, lead, copper, gold and silver have been discovered by E. Rouleau, Barraute prospector, in the north central part of Fiedmont township (Geoffroy and Koulomzine 1960). One of these was located at the north end of lot 31, range VIII, in the valley of Barraute creek. This subangular float, about a foot in diameter, was made up of fine-grained cherty rock and contained sphalerite, galena, pyrite, pyrrhotite and some chalcopyrite. A larger and richer float of almost massive sphalerite and galena was discovered just outside the map-area in the northwest corner of lot 33, range VIII, Fiedmont township. A specimen of this float assayed 35 per cent zinc,

11 per cent lead and 7 oz. of silver per ton. Some carbonate and chert boulders of various sizes and shapes containing pyrite with some sphalerite and minor chalcopyrite are strewn in a west to east direction in a boulder train at the north end of lots 30 and 31, range IX. Two gold-bearing floats were found, one in the centre of lot 31, range X, and the other in the south part of lot 31, range IX.

Blocks of conglomerate at the south end of lot 20, range X, can only come from the band of sedimentary rocks two miles to the west. The boulders in the north and central parts of lots 30 and 31, range IX, appear to have been strewn in a west to east direction. There are strong suggestions that the mineralized floats have a provenance from the northwest and that they are not related to the Belfort-Barvallee-Mogador deposits. Therefore, there may be one or more base metal sulphide bodies undiscovered in the northwest quarter of Fiedmont township or in the southwest corner of Barraute township.

Description of Mining Properties

Bar Metals Mines Ltd.

The property of Bar Metals Mines Ltd. covered the north halves of lots 19 to 21, and lots 22 to 26, range X, Fiedmont township.

In 1951 and 1952, a magnetometer survey and 6,431 feet of diamond drilling in 7 holes were completed. These cut massive siliceous and intermediate volcanic rocks, diorite, diorite porphyry, tuff, and agglomerate. Very little shearing and alteration were found and the only mineralization was a little pyrite with no gold, zinc or silver.

Barvallee Mines Ltd.

Ref.: Que. Dept. of Mines, Preliminary Report No. 406, p. 10, 1959

The property of Barvallee Mines Ltd. covers lots 27 to 30, range X, and lots 29 and 30, range IX, Fiedmont township.

The property is underlain by lava flows and pyroclastic rocks cut by numerous dykes and sills of diorite, granodiorite and quartz feldspar porphyry. There are many zones of disseminated pyrite and pyrrhotite mineralization within the tuffaceous bands. The formations strike N.70°W. and dip 60° north.

In 1951-52, the company drilled 9 diamond-drill holes for a total of 6,636 feet. The rocks cut were intermediate to siliceous lavas with interbedded tuffs and some agglomerates. A few zones of scattered and disseminated sulphides were intersected. The best assay return was 1.5 ounces of silver per ton and 1.82 per cent zinc across 2 feet.

In 1956-57, the company carried out 20,633 feet of diamond drilling in 38 holes. A sulphide zone with copper, zinc and silver mineralization was outlined in the northeast corner of lot 28, range X. The zone strikes N.70°W. and dips 60° northeast. It has a length of 400 feet, widths of 6 to 25 feet, and a depth of 400 feet. The sulphides occur in lenses en échelon in brecciated and irregular cherty or porcellanite-like tuffaceous sedimentary zones in siliceous lavas and tuffs.

Reserves are estimated by the company at 216,500 tons grading 5.71 per cent zinc, 1.23 per cent copper and 1.42 ounces of silver per ton.

Derogan Asbestos Corporation Ltd.

The property of Derogan Asbestos Corporation Ltd. covered lots 25 to 30, range VI, and the east halves of lots 29 and 30, range V, Fiedmont township.

In 1955, the company carried out a magnetometer survey over the claims.

Marcoland Mines Ltd.

The property of Marcoland Mines Ltd. covered lots 4 to 15, range VII, Fiedmont township.

In 1955, the company carried out a magnetometer survey over the claim group. Pyrite and pyrrhotite in quartzite bands which appear in surface exposures can be traced magnetically across the northeast corner of the property.

Martin-McNeely Mines Ltd.

The property of Martin-McNeely Mines Ltd. covered lots 7 to 14, range IX, Fiedmont township.

In 1955, three holes totalling 1,610 feet were drilled in about the centre of lots 7 and 8, range IX. The rocks cut were mostly greywacke with some conglomerate intruded by numerous dykes and sills of granite, porphyry and pegmatite. In one hole a two-foot quartz vein is mineralized with pyrite and some fine stringers of molybdenite.

Sentry Petroleum Ltd.

The property of Sentry Petroleum Ltd. consisted of lots 18 to 24, range VIII, Fiedmont township.

In 1957, this company carried out a Ronka electromagnetic survey over the claim group. Only one conductor of interest was located but it had no noticeable extension on adjacent lines.

Tud Cobalt Mines Ltd.

The property of Tud Cobalt Mines Ltd. covered lots 11 to 18, range X, Fiedmont township.

In 1956, this company carried out a magnetometer survey over the claim group.

Vallee Lithium Mining Corporation Ltd.

Ref.: Que. Dept. of Mines, Preliminary Report No. 390, p. 48, 1959.

Vallee Lithium Mining Corporation Ltd. holds the north halves of lots 2 to 6, range VIII, and the south halves of lots 1 to 4, range IX, Fiedmont township.

The contact of the Lacorne batholith runs diagonally across the claim group. The northeastern part of the property is underlain by amphibolitized lavas and pyroclastic rocks intruded by numerous sills and dykes of gabbro, peridotite and granite. The volcanic and gabbroic formations strike in a north-south direction in the range IX claims and swing to an east-west direction in the range VIII claims. Dips are from 40° to 80° to the east or to the north, depending on the strike. These rocks are on the south limb of a large anticlinal fold, and are part of a large local drag fold. The south-west part of the claim group is underlain by granodiorite of the Lacorne batholith.

In 1956, 13,759 feet of diamond drilling in 21 holes was completed on the property. Four holes failed to reach bed rock. Eleven holes were put down in the south quarter of lot 1, range IX. These cut mostly granodiorite with inclusions of volcanic rocks and some basic intrusive rocks. The remaining holes were drilled in the contact of the batholithic granodiorite and the volcanic rocks in lots 3 and 4, range VIII. Pegmatite dykes were numerous, but those containing spodumene, the lithium-bearing mineral, were located only in the southwest corner of lot 1, range IX. These spodumene dykes had no continuity. Hole No. 12, drilled N.50°E. from the southwest corner of lot 1, range IX, returned 1.08 per cent lithia across 34.0 feet, but a section within this zone gave 16 feet of 1.38 per cent lithia. Another hole to the north cut 13 feet of pegmatite assaying 1.3 per cent lithia. Holes on both sides of these failed to cut anything of comparable value. All the other assays were below 1.0 per cent lithia.

Vendome Mines Ltd. (Mogador Mines Ltd.)

Ref.: Que. Dept. of Mines, Preliminary Report No. 364, p. 10, 1958.

Vendome Mines Ltd. hold lot 31, range X, and the north half of lot 31, range IX, in the map-area. The remaining part of the property is in the northeast quarter of Fiedmont township and in Barraute township.

The company's base metal deposit, which contains 1,121,000 tons grading 7.3 per cent zinc, 0.47 per cent copper and 0.34 per cent lead, is located in lot 33, range X, (Geoffroy and Koulomzine 1960).

In lot 31, range X, 5 diamond-drill holes, totalling 2,130 feet, cut andesite, dacite, diorite and granodiorite. Only narrow zones of pyrite and pyrrhotite in pyroclastic rocks were intersected.

Canadian Shield Mining Corp.

The Canadian Shield Mining Corp. owns the south halves of lots 19 to 26, range X; the north halves of lots 17 to 23, all of lots 24 to 28 and the south half of lot 31, range IX; and the north halves of lots 29 to 33, range VIII, all in Fiedmont township.

Bar Metals Mines Ltd. in 1952 drilled a cross section of 4 holes along the west side of lot 23, range X.

In 1960-61, magnetic, electromagnetic, self-potential and geochemical surveys were carried out over parts of the property. During 1961, 31 diamond-drill holes for a total of 9,428 feet were put down. The holes were well distributed in lots 25 to 28, range IX, in the north end of lots 21 and 22, range IX, and in the south end of lot 24, range X. The purpose of this work was to locate the source of copper, zinc and lead floats found east of the property.

Twelve of the 19 holes drilled in lots 25 to 28, range IX, tested a granodiorite and quartz diorite plug and its contact zone. This intrusive mass, which is about 6,500 feet long and up to 3,000 feet wide, has a central core of albite granite which grades into granodiorite, quartz diorite, quartz gabbro, amphibolite and peridotite. Peridotite, which is an ultrabasic phase of the intrusive, lies on the northwest nose of the mass. If the mass plunges to the southeast, the peridotite phase represents the bottom of the intrusive body. Disseminated pyrite, pyrrhotite, chalcopyrite and a nickel sulphide (probably pentlandite) are found locally within the amphibolitic phase of the intrusive. The amphibolite forms an aureole along the west edge of the mass. The contact rocks are rhyolitic lavas, cherty tuffs and minor andesite.

Low assays in nickel and copper are obtained throughout the amphibolite. Most nickel assays are between 0.1 and 0.5 per cent, and copper assays, between 0.01 and 0.4 per cent. Locally within the amphibolite where the pyrite or pyrrhotite content increases to 5 or 10 per cent, nickel and copper content also increases. The best nickel assays returned 1.44 per cent across 2 feet and 0.96 per cent across 1 foot. The best copper assays returned 1.07 per cent across 0.5 foot and 0.75 per cent across 2 feet. No sulphide minerals were seen in the peridotite core from the hole at the north end of lot 26, range IX. Assaying of selected samples of this core gave an average of 0.22 per cent nickel.

Eight holes drilled at the north end of lots 21 and 22, range IX, cut rhyolitic lavas, cherty tuffs, minor andesite, and quartz diorite sills. Three holes drilled at the south end of lot 24, range X, cut andesitic lavas interbedded with siliceous lavas and tuffs.

The work on the Canadian Shield Mining Corp. property was directed by P.R. Geoffroy of Montreal.

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