

RP 554(A)

PRELIMINARY REPORT, GEOLOGY OF EAST HALF OF GABOURY TOWNSHIP, TEMISCAMINGUE COUNTY

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DEPARTMENT OF NATURAL RESOURCES

Honorable DANIEL JOHNSON
Minister

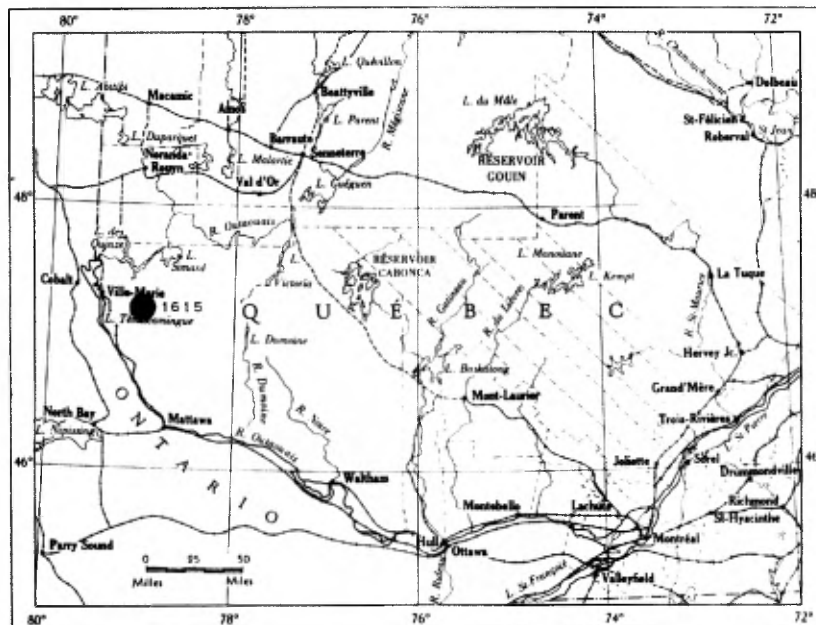
PAUL-EMILE AUGER
Deputy Minister

Geology
of the
EAST HALF OF GABOURY TOWNSHIP
TÉMISCAMINGUE COUNTY

PRELIMINARY REPORT

by

Leslie Kish



QUEBEC

1966

QUEBEC DEPARTMENT OF NATURAL RESOURCES

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MINERAL DEPOSITS SERVICE

ROBERT ASSAD, Director

Geology
of the
EAST HALF OF GABOURY TOWNSHIP

TÉMISCAMINGUE COUNTY

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Preliminary Report

on the

EAST HALF OF GABOURY TOWNSHIP

Témiscamingue County

by

Leslie Kish

INTRODUCTION

Gaboury township is situated in Témiscamingue county, about 20 miles east of Témiscamingue lake. The eastern half of the township comprises an area of about 35 square miles.

The village of Latulipe is located two miles north of the map-area, on Highway 62, which leads from Ville-Marie to Belleterre. The central part of the map-area can be reached by the ten-mile-long motor road connecting Latulipe with des Bois lake. Another motor road enters the area near its northeast corner and joins Highway 62 to the property of Lorraine Mining Co. Ltd.

The southern part of the township is accessible only by portages. One trail connects des Bois lake with McKenzie lake and another portage leads from des Bois lake to Mouffette lake, in the southeast corner of the township.

The area was mapped in 1964 at a scale of 500 feet to the inch. Owing to the abundance of outcrops, only those seen along traverses are shown on the map. Ranges I and II were not mapped in detail and the geology of this area is inferred from reconnaissance traverses.

TOPOGRAPHY

The area is characterized by gently rolling hills, which may reach about 1,200 feet above sealevel. The maximum difference in elevation is about 300 feet. The southern part of the area is hilly; the northern part is covered by glacial clay and sand deposits incised by meandering stream channels. The area drains north into des Quinze lake through des Bois, McKenzie and Fraser rivers.

GENERAL GEOLOGY

The bedrock is of Precambrian age. A three-fold subdivision is apparent from the accompanying map:

1. In the central part of the area a belt of metamorphosed lavas and pyroclastic rocks intruded by various igneous rocks extends roughly east-west. In the report, this complex unit of extrusive and associated intrusive rocks is referred to as the "central belt".

2. South of the central belt, the area is underlain by sedimentary rocks which are metamorphosed into parashists, injected, and complexly mixed with granitic and pegmatitic material.

3. North of the volcanic belt a large mass of gneissic granite extends beyond the limits of the area.

The age relationships between these three groups of rocks are only partly established. Top determinations in the central belt suggest that the flows face south, and field evidence indicates that the sedimentary rocks of the south belt are younger.

Table of Formations

PLEISTOCENE and RECENT	Clay, Sand, Boulders, Till	
LATE PRECAMBRIAN	Diabase dikes	
EARLY PRECAMBRIAN	Intrusive rocks (north belt)	Gray gneissic granite (age relation uncertain)
	Intrusive rocks (south belt)	Pink pegmatitic granite
	Metasedimentary rocks (south belt)	Paraschist injected with granite Biotite paraschist, minor conglomerate
	Intrusive rocks (central belt)	Lamprophyre Aplite Pink porphyritic granite Quartz porphyry Porphyritic syenite, Syenite Metadiorite (granitized) Metadiorite (chloritized) Diorite Gabbro with minor pyroxenite Serpentinite
	Mainly volcanic rocks (central belt)	Iron formation Agglomerate Tuff Rhyolite Dacite Andesite: massive, pillowed, porphyritic, dioritic

Concerning the intrusive rocks, it is known that the porphyritic syenite intrudes the gabbro and diorite. Generally, the felsic igneous rocks are considered younger than the more mafic. The lamprophyre dikes in the area cut only the volcanic rocks of the central belt but are known from nearby areas to be one of the youngest rocks of the region.

Pink pegmatitic granite is injected into the metasedimentary rocks of the south belt. The gray gneissic granite of the north belt is intrusive into the volcanic rocks, as indicated by inclusions of andesite. Its relation to the metasedimentary rocks of the south belt and to other felsic intrusive rocks in the area is unknown.

Volcanic rocks (Central belt)

Andesite

Andesite is the most common rock type in the central belt. In hand specimen the rock is fine grained and dark green in color. The main mafic minerals are amphibole and chlorite and the rock is commonly schistose. Volcanic structures such as flow lines and amygdules are common. The pillows are generally elongated but, in several places, their shape may be used to determine the top of the flow.

A porphyritic variety of andesite forms mappable units. The feldspar phenocrysts are euhedral in the massive rock but resemble amygdules in the sheared rock.

Dioritic andesite

This rock type represents a transition between the andesite, with which it is associated, and the diorite. The grain size permits one to distinguish altered feldspar and hornblende with the naked eye. The rock is usually massive and occurs as irregular patches, mostly in range IV.

Dacite

A light gray and fine-grained rock with quartz visible in hand specimen was mapped as dacite.

Rhyolite

Rhyolite is particularly abundant southwest of des Bois lake but is also present in other parts of the central belt. It is easily recognizable by the fine grain size, light green or creamy color, the glassy aspect of the fractured surface and, in places, by quartz eyes.

Tuff

Discontinuous layers of fine-grained and light-gray tuff occur in the central belt of volcanic rocks in units generally less than 300 feet thick and 1,000 feet long. The tuff is metamorphosed and has lost its vitreous character. Thin layering is a common feature.

Agglomerate

Some agglomerate is interlayered with volcanic rocks in the western part of the central belt. Fragments in the agglomerate are either angular or ovoid and are usually lighter in color than the matrix. They are generally from 2 to 6 inches in diameter and mostly rhyolitic in composition. The principal outcrops of agglomerate are found in the western part of the central volcanic belt.

The andesite belt which extends southwest of des Bois lake along the pink porphyritic granite contains fragments, presumably of pyroclastic origin. These, however, are scarce and the rock cannot be properly classified as agglomerate. Elongation of the bombs is parallel to the schistosity of the andesite and the deformation of pillows is along the same direction.

Iron formation

Iron formation occurs as 2- to 12-foot-thick layers in andesite and is exposed discontinuously from McKenzie lake to the east shore of des Bois lake. The rock is very fine-grained and consists of alternating thin layers of glassy quartz and magnetite. In the overburden areas, the

iron formation can be detected by strong magnetic attraction. East of des Bois lake, the extension of the iron formation was found by diamond drilling.

Intrusive rocks (central belt)

Serpentinite

An elongated body of serpentinite, which contains narrow and irregular veinlets of asbestos, extends through McKenzie lake across the peninsula and the small island. The weathered surface is light gray and is irregularly fractured. The fresh surface is dark blue.

Gabbro

Irregular bodies of altered gabbro are found in the eastern part of range III, west of des Bois lake and west-northwest of McNab lake. The least altered variety of gabbro occurs near McNab lake. It is massive, dark and medium to coarse grained, and contains some primary pyroxene. The gabbro west of des Bois lake is intensely altered, but relic ophitic texture can be observed in some hand specimens. Dark and coarse pyroxenite facies in the gabbro are found near Lorraine mine and west of des Bois lake.

Diorite

Altered dioritic rocks form sills and lenses and are widely scattered in the central belt. The difference in composition between gabbro and diorite is not obvious in the field but, in general, the grain is smaller and the ophitic texture is absent in the diorite. Sharp contacts between diorite and volcanic rocks indicate an intrusive relationship.

Metadiorite

The rocks of the central belt are separated from the gneissic granites to the north by a zone of medium-grained

rocks, probably diorites or gabbros, that are so intensely altered that their origin is doubtful. Because of their resemblance to diorite, these rocks were tentatively named "metadiorites". Two types can be distinguished. The chloritized and amphibolitized type is a greenish-gray rock and occupies the southern margin of the contact zone; the granitized type is along its northern border and contains 5 to 15% quartz.

Porphyritic syenite and syenite

An irregular mass of porphyritic syenite extends south from McKenzie lake. The rock is either massive or sheared and varies in shades of gray. The feldspar phenocrysts are clouded and, in the sheared variety, they appear as augen. Syenitic dikes, generally even grained, are common between des Bois lake and McKenzie lake. Some of them show intense deformation.

Quartz porphyry

A northeasterly-trending lens and several dikes of this rock are found north of des Bois lake. Quartz eyes are set in a fine-grained, gray matrix. The rock is commonly sheared and has a rough weathered surface.

Pink porphyritic granite

A lenticular body of porphyritic granite extends northeasterly across des Bois lake. The rock is massive and has a fresh appearance with phenocrysts of pink feldspar up to 2 cm. long.

Aplite

Narrow grayish pink or light pink dikes of aplite cut the volcanic rocks near the northern margin of the central belt. Many of the dikes are too small to be shown on the map. The rock is massive and very fine grained, and is composed of quartz and feldspar.

Lamprophyre

Dark dikes of lamprophyre cut the rocks of the central belt. Their maximum width is 3 feet and only some of the dikes are shown on the map. The dike material is medium grained, and massive, and contains biotite and hornblende. Rounded inclusions are seen in the lamprophyre dikes near McKenzie lake. The inclusions range from 1/2 inch to 2 inches in diameter and presumably derive from the adjacent rocks.

Metasedimentary rocks (south belt)

The southern part of the area is underlain by metamorphosed sedimentary rocks which are injected by granitic material. The most abundant rock type is a fine-grained biotite paraschist. Slight differences in texture and composition can be noted from place to place but, in general, the rock is fine grained and the schistosity is well marked. Biotite is a common mafic mineral and, in many places, euhedral crystals of red garnet are noticeable in hand specimen. Staurolite was noted in several garnetiferous specimens. The schistosity of the epidote-bearing variety is less conspicuous.

The paraschist is injected by granitic material along the strike of the schistosity, in a lit-par-lit manner. However, complex mixing and distortion of the general trend of schistosity also occur. On the map, the injected paraschist is shown separately.

Conglomerate with pebbles up to 1.5 inches occurs in the sedimentary sequence near McNab lake. The pebbles are composed of quartz-rich material and are slightly different from the schistose matrix.

Intrusive rocks (south belt)

Pink pegmatitic granite

The pink granite injected into the paraschists is massive and some facies are pegmatitic. In general the granite is leucocratic and the accessory minerals are biotite and muscovite.

Intrusive rocks (north belt)

Gray gneissic granite

The granite north of the central belt is coarse grained and gray or greenish gray with chlorite as the common mafic mineral. The outline of the crystals is blurred. The gneissic texture can be observed readily on the weathered surface of the rock because the quartz, being more resistant to erosion, stands out on surface. The gneissic granite contains inclusions of andesite.

Late Precambrian dikes

Diabase

The latest intrusive rock in the area is diabase. In the area southwest of Lorraine mine, dikes up to 30 feet wide trend west-northwest. The rock is hard and massive, and has a rusty-brown weathered surface. It is composed of unaltered plagioclase and pyroxene, and the ophitic texture is easily observable on fresh surface.

STRUCTURAL GEOLOGY

The contact relations indicate that the nearly vertical sequence of volcanic and metasedimentary rocks has been tilted to the south and that the sedimentary rocks are younger.

In the central belt of volcanic rocks the pillows are distorted and the determination of the top of the flows is possible only in rare instances.

In the central belt and north of des Bois lake, the schistosity of the volcanic rocks strikes east or slightly south of east and, in general, the dip is very steep to the south or vertical. A major deviation from the east-west trend was noted west and southwest of des Bois lake where the

elongation of pillows and the strike of schistosity are north-east. A shear zone is parallel to this trend and the elongation of the porphyritic granite body is in the same direction.

The schistosity is well pronounced in the metamorphosed sediments. East of Legrand (Long) lake and southwest of Castor lake the schistosity strikes east-west and dips 80 to 85°N. Granitic material, injected in a lit-par-lit fashion, caused only slight distortion in the general trend. However, in places, the injection is irregular and the schistosity is contorted, as is the case west of Legrand lake.

Displacement is indicated across a northeast fault underlying McNab lake, and about 1,200 feet west of the lake.

Two faults occupy well-marked valleys south of des Bois lake. Both faults are accompanied by shear zones marked by dark and soft chlorite-schist. The faults strike N.10°E. and N.40°E. and intersect at the south end of des Bois lake.

ECONOMIC GEOLOGY

Prospecting was initiated in Gaboury township when gold was discovered in the Belleterre area, about 15 miles east of the map-area. The discovery resulted in the production of gold by Belleterre Quebec Mines Ltd. from 1936 to 1959.

A copper-nickel orebody was discovered within the map-area in 1961 and is presently being mined by Lorraine Mining Co. Ltd.

Iron formation is exposed in McKenzie lake and extends east through des Bois lake up to the eastern boundary of the township.

Asbestos is present in the serpentinite east of McKenzie lake in irregular veinlets and along shear surfaces.

Tungsten is found on lot 29, range IV. This scheelite occurrence is associated with quartz veins and granite intrusions in sheared andesite.

Several outcrops mineralized mostly with pyrite are indicated on the map. Some samples collected by the writer were analysed, but the highest copper assay returned only 0.12%.

Description of Mining Properties

Lorraine Mining Co. Ltd.

Ref: Que. Dept. of Nat. Res., P.R. No. 529, p. 20.

Lorraine Mining Co. Ltd., a subsidiary of McIntyre Porcupine Mines Ltd. holds 61 claims in the east part of Gaboury township and in adjacent Blondeau township. The claims held in Gaboury township consist of lots 44 to 52 in range III and the north half of the same lots in range IV. The surface showing, located at the base of a hill in the south part of lot 51, range III, was discovered by prospector O'Brien Rivard in 1961. It was first explored by Mespil Mines Ltd. and was later optioned by the present owner.

The north part of the property is underlain by gray gneissic granite and metadiorite and the south part by volcanic rocks intruded by gabbro, diorite and later diabase.

An induced polarization survey and diamond drilling have outlined an orebody of sufficient size and grade to be exploited. The orebody measures about 250 feet in length and 20 to 30 feet in width, and it conforms to the andesite-gabbro contact, with an elongation in the direction N.65°E. and a dip of about 70° south. The ore minerals are chalcopyrite, pyrrhotite, pentlandite and a number of minor opaque minerals. The sulfides occur as disseminations, stringers or almost massive forms.

From 33 holes drilled on surface before the sinking of the shaft, the company estimated reserves to a depth of 800 feet to total approximately 550,000 tons grading 1.5% copper, 0.6% nickel and about one dollar's worth of precious metals per ton.

Production started at the end of 1964 at a rate of 400 tons a day, and has since reached 450 tons a day.

Delhi Pacific Mines Ltd.

Delhi Pacific Mines Ltd. holds 16 claims located east of des Bois lake and numbered 194389 and 194390, claims 1 to 5; 13491, claims 1 to 4; and 13492, claims 1 and 2. The property was covered by magnetic and electromagnetic surveys in 1963. This work was followed by the drilling of two holes, about 1,000 feet west of des Pins lake. One hole intersected iron formation.

Acme Gas and Oil Co. Ltd.

Acme Gas and Oil Co. Ltd. acquired a large property west of Lorraine Mining, consisting of lots 20 to 43 in range III; lots 7 to 27, 34 to 43, the south half of lots 28, 29 and the north half of lots 32, 33 in range IV, as well as the following claims in the unsurveyed part of the township: 220187 to 220189, claims 1 to 5. Magnetic, electromagnetic and self-potential surveys were carried out in 1965, and two holes were drilled on lots 39 and 40, range III.

Lavallée claims

Alfred Lavallée holds lots 38 to 41, in range II. A 15-foot-wide shear zone extends near range-line I-II on lots 39, 40, 41. Quartz mineralized with pyrite has been introduced into the shear zone. Specimens taken by the writer from three different localities yielded only low assays in gold and silver. The highest copper assay was 0.11% and the highest gold content was 0.05 ounce per ton.

W. Giroux claims

W. Giroux owns the north half of lots 28 to 31 inclusive in range IV. This is part of what was formerly known as the Petosa Tungsten property. On lot 29, a scheelite showing has been trenched and sampled at various times. The average grade was considered to be too low.

Exploration on lapsed claims

Témiscamingue Metal Ltée.

Ref: Q.D.M., P.R. No. 330, p. 47 - Geol. Surv. Can., Mem. 201,
p. 31.

Témiscamingue Metal Ltée conducted exploration on its 30-claim property around des Bois lake in 1952. A magnetometric survey was carried out and two mineralized showings containing abundant pyrite were checked by five diamond-drill holes. No results of economic importance were reported. Parts of the property were later held by Consolidated Tungsten Mining Corp., Delhi Pacific Mines Ltd. and Silvermaque Mining Co.

Consolidated Tungsten Mining Corp. of Canada Ltd.

In 1957, Consolidated Tungsten Mining Corp. drilled five holes south of des Bois lake to test anomalies indicated by a magnetometric survey. Most of the holes intersected iron formation.

Silvermaque Mining Ltd.

Silvermaque Mining Ltd. extended the magnetometric and electromagnetic exploration undertaken by Témiscamingue Métal Ltée. south of des Bois lake. Two holes were drilled in 1963 across magnetic anomalies caused by iron formation. One intersection of 49 feet containing 15 to 20% iron is reported.

Quewest Mining Corporation Ltd.

Quewest Mining Corporation Ltd. conducted a magnetometric survey on some claims at the east end of McKenzie lake so as to outline a serpentinite body. One diamond drill hole was bored in 1963. It intersected some asbestos, mostly of the slip-fiber variety, but some cross-fibers up to 1/2 inch wide are reported.

Geochemical sampling

Samples from stream sediments were collected during the field work and analysed for copper, zinc, lead and molybdenum. The results of this preliminary survey are shown on the accompanying geological map.

