GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

SHEET 21 $\frac{P}{4}$ (West Half)

LEGEND

PALÆOZOIC

PENNSYLVANIAN

7 — *CLIFTON FORMATION:* grey sandstone, grey to green siltstone

6 — *BATHURST FORMATION:* red conglomerate, grit, sandstone; minor red shale

DEVONIAN (?)

5 — *Diabasic gabbro*

ORDOVICIAN

TETAGOUCHE GROUP (2-4)

4 — *Shale, greywacke, conglomerate, siltstone; minor graphitic schist, tuff, and lava*

3 — *Basic lavas; minor pyroclastic and sedimentary rocks*

2 — *Rhyolite and pyroclastic rocks; minor sedimentary rocks:* **2a**, *quartz-feldspar porphyry*

ORDOVICIAN OR EARLIER

1 — *Quartzite and slate*

Rock outcrop
Bedding (inclined, vertical, dip unknown, direction of top unknown)
Schistosity, cleavage (horizontal, inclined, vertical, dip unknown)
Lineation (plunge known)
Fault (defined, assumed, dip known, dip unknown)
Joints (horizontal, inclined, vertical)
Anticlinal axis (assumed)
Synclinal axis (assumed)
Glacial striæ (direction known, unknown)
Fossil locality (F)
Mineral occurrence (copper, Cu) Cu

INDEX TO MINERAL PROSPECTS

1. Roche Long Lac Gold Mines Limited
2. Timmins (1938) Limited N. A.
3. Karl Springer
4. Oka-Bathurst Mining Corporation Limited

Geology by K. R. Dawson, 1956

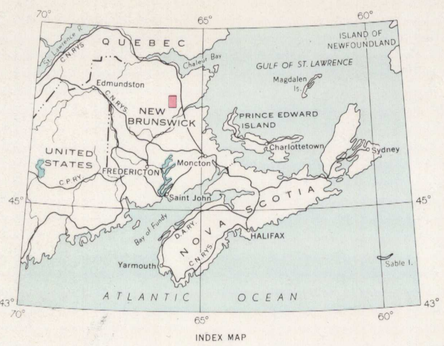
Cartography by the Geological Survey of Canada, 1960

Road and buildings
Road not well travelled
Cart track
Trail
Church
Post Office
Bridge
Horizontal control point
County boundary
Parish boundary
Indian Reserve boundary
Intermittent stream
Marsh
Sand or gravel
Contours (interval 50 feet)

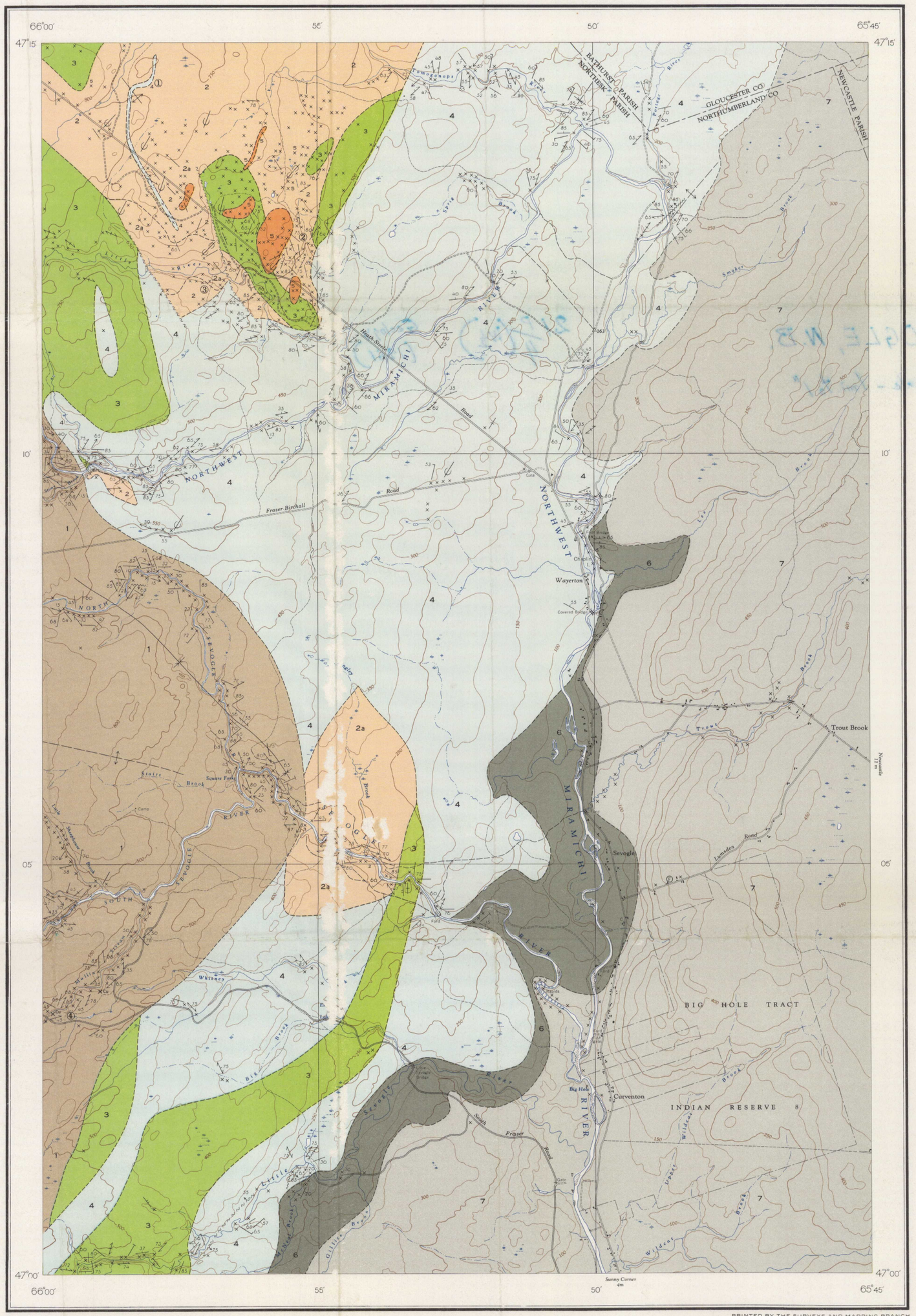
Base-map compiled and drawn by the Topographical Survey, 1956

Air photographs covering this map-area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa, Ontario

Approximate magnetic declination, 23° 35′ West



INDEX MAP



PUBLISHED, 1961
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MAP 1092A

GEOLOGY

SEVOGLE

NORTHUMBERLAND AND GLOUCESTER COUNTIES
NEW BRUNSWICK

Scale: One Inch to One Mile = $\frac{1}{63,360}$

Miles

1 ½ 0 1 2 3

DESCRIPTIVE NOTES

Surficial material covers 95 per cent of the area. Extensive sand and gravel deposits occur along Northwest Miramichi River, at the mouth of Sevogle River, in the vicinity of Wayerton bridge, between the north branch of Sevogle River and the Fraser-Birchall road, on Little River at the west side of the sheet, and at points on the Heath-Steele road. Boulder clay is exposed on Little Sheephouse Brook and bedded clay in a road-cut north of Wildcat Brook. Little or no gravel is exposed east of Northwest Miramichi River.

The quartzite of unit 1 is very fine grained and well indurated, and varies from green to black. Bedding is marked by slight variations in grain size. It consists essentially of quartz with various amounts of angular plagioclase fragments that rarely exceed 1.5 mm in diameter. Sericite, kaolinite, and pyrite are accessory minerals. The slates are black with weakly developed colour banding. By X-ray diffraction examination by Miss A. P. Sabina they were found to consist mainly of submicroscopic chlorite and mica, with sparsely disseminated angular grains of quartz. These rocks are cut by numerous milky quartz veins which contain minor amounts of chalcopyrite.

The rocks of unit 1 are so deformed that interbed differences in grain size is the only reliable criterion for distinguishing between bedding and flow cleavage. Lineation symbols on the map represent crestlines of drag-folds.

Neither the age nor the stratigraphic position of unit 1 is known accurately. No fossils have been found and exposures of the contact with adjoining rock units are lacking. Shaw[4] concluded that they form the core of a northeasterly plunging anticline, but recent work suggests that the rocks of units 1 and 4 may be stratigraphic equivalents. The rocks of the two units are lithologically similar except that greywacke is abundant in unit 4, and quartzite is abundant in unit 1. This may, however, represent a facies change along strike. The presence of many quartz veins and copper minerals in unit 1, the high degree of deformation, and the east-trending folds near the Square Forks may be all due to the presence of an underlying granite intrusion, and consequently local phenomena. Until more conclusive evidence is found however the writer prefers to continue to separate unit 1 from unit 4, on a lithological basis.

Unit 2 includes the rhyolites, pyroclastic rocks, and quartz-feldspar porphyries (2a) that outcrop on Sevogle River near Tingley Brook and north of Little River. The rhyolites are white weathering, light to dark coloured massive or sheared, microcrystalline rocks. Some contain phenocrysts of quarts and/or feldspar. The pyroclastic rocks range from agglomerates with fragments 6 inches long to fine-grained, poorly bedded tuffs. Some fragments of coarse-grained porphyry have been observed in the agglomerates. The quartz-feldspar porphyries (2a) are light coloured, plagioclase-bearing rocks with medium to large sized crystals embedded in a massive or sheared matrix. Approximately 20% of these rocks contain potassium-bearing minerals. Potassium feldspar has been identified in specimens from outcrops near Little River just west of the map-area and west of the mouth of Tingley Brook on Sevogle River.

The acid volcanic rocks are too massive for their structures to be readily determined. Bedding has been measured on mineralogical banding in a few outcrops of rhyolites and by using the long axis of fragments in some agglomeratic beds. If those measurements are reliable, these rocks may form the upper part of the east limb of a southwest-trending anticline, complicated by drag-folds and faults. The quartz-feldspar porphyry that outcrops south of the Heath-Steele road appears to intrude rhyolite and agglomerate; north of the road its intrusive relationships are unknown. On Sevogle River it is moderately sheared and locally interbedded with kaolinite-bearing sedimentary rocks. At the mouth of the Tingley Brook sills of the porphyry 5 feet thick are folded, together with shales and greywackes, to produce an east-trending anticline.

Unit 3 consists of basaltic lavas and cherts with a few thin beds of sedimentary rocks. These lavas vary from dark green to black, from massive to pillowed or banded, and some contain amygdules filled with calcite or chlorite. The primary minerals include plagioclase, pyroxene, hornblende, and accessory apatite, pyrite, magnetite, and quartz. The lavas show various degrees of alteration, demonstrated by the occurrence of epidote, chlorite, and calcite, and by the poor preservation of the primary ophitic texture. Magnetite is a minor constituent of both lava and chert, especially the latter. Chip samples from some flows showed the magnetic susceptibility to be 76 x 10^{-6} and 2, 010 x 10^{-6} c.g.s. units, and those from the cherts interbedded with the lavas north of Heath-Steele road gave magnetic susceptibility of 18,300 x 10^{-6}, 17, 700 x 10^{-6}, and 132 x 10^{-6} c.g.s. units. Consequently, anomalies in that part of the area are caused by magnetite-bearing cherts.

The two southern areas of basalt are believed to lie conformably within the sedimentary rocks of unit 4, the distribution of basalt, in the absence of outcrops, being inferred from aeromagnetic data. North of Northwest Miramichi River much of the distribution is similarly inferred. The shape of the anomaly[5] suggests that the magnetic layer dips to the southwest. North of the Heath-Steele road aeromagnetic data also point to the occurrence of basalts, which probably occur as separate flows in the east limb of a northeast-trending anticline.

Unit 4, consisting mainly of shale and greywacke with minor conglomerate and tuff, has been correlated with the Tetagouche group on the basis of lithology and of graptolites found in calcareous mudstone float[2] approximately 1 mile west of Little Sevogle bridge on the south Fraser road. The shales vary in colour from green to mottled red or black with complex secondary colour banding in addition to primary mineralogical banding. In thin sections they are seen to contain submicroscopic aggregates of chlorite and mica or illite containing accessory disseminated pyrite, angular quartz grains, and carbonaceous material. The illite was determined by Miss A. P. Sabina using an X-ray diffractometer. Interbedded with the shales are carbonaceous horizons which are either black shales with identifiable primary structures or black siliceous breccias without such structures. This last type of rock commonly underlies the electromagnetic (EM) anomalies in the map-area. Most of the greywackes are green, and are coarser grained than the shales and occur in thicker beds. They are also interbedded with some conglomerates containing shale pebbles. All three rock varieties are commonly interbedded. Tuffaceous beds are probably present, but positive evidence is lacking.

The rocks of unit 4 are well bedded and show cleavage and jointing related to regional folds. Minor faults, many of them strike faults, have been observed but no evidence for displacement of consequence was seen. Two southwest-trending fold axes have been mapped, one near Tomogonops River and one near Portage River. These are parallel with the general strike of the rocks everywhere except in the area between the mouth of Little River and the mouth of Stony Brook, where the rocks have a general westerly strike.

The diabasic gabbro (5) is medium to coarse grained and occurs in widely separated outcrops. Dykes and stocks are the common forms and are found exclusively in rocks of the Tetagouche group. In thin sections the texture is commonly ophitic. Plagioclase, hornblende, and pyroxene are the main constituents with accessory magnetite, apatite, pyrrhotite, and ilmenite, and various amounts of secondary epidote, chlorite, serpentine, and carbonate. The sparsely disseminated magnetite and pyrrhotite account for some of the magnetic anomalies in the area[5]. Three chip samples of the gabbros gave the following magnetic susceptibilities: 3, 560 x 10^{-6}, 132 x 10^{-6}, and 32 x 10^{-6} c.g.s. units. The highest reading comes from the outcrops on the Heath-Steele road 5.2 miles west of the Fraser-Birchall gate.

The Bathurst formation (6) is flat lying and unconformably overlies rocks of the Tetagouche group, and conformably underlies rocks of the Clifton formation. The sandstones consist mainly of subrounded detrital quartz in a matrix of finer grained quartz, micaceous material, calcite and hematite dust. Limestone pebbles and boulders are locally present in the conglomerate which is characterized by the dominance of quartz pebbles. Interbedded sandstones and conglomerate occur near the bottom of the formation. Weakly developed vertical joints are present.

Unit 7, which is correlated with the Clifton formation, underlies the east side of the map-area. The few exposures are medium grained, grey to yellow, flaggy sandstone, with a few thin beds of siltstone and shale. The sandstone consists of slightly rounded fragments of quartz, chert, quartzite, and lava, and flakes of argillite, the whole cemented by calcite and a little clay material. Opaque minerals are restricted to accessory magnetite and carbonaceous material. The sandstone contains fragments of plant remains, and a thin seam of impure coal on Lumsden road was determined by P. A. Hacquebard to be of Pennsylvanian age. The rocks of this formation are flat lying and weakly jointed. Near the mouth of Sevogle River some are strongly crossbedded.

Drilling programs have been completed on the Roche Long Lac, Timmins, Springer, and Oka-Bathurst properties. Copper minerals have been detected in the Roche Long Lac and Oka-Bathurst properties. Several hundred miles of line have been cut for electromagnetic and geological surveys of properties.

[1]Alcock, F. J.: Jacquet River and Tetagouche River Map-areas, New Brunswick; Geol. Surv., Canada, Mem. 227 (1941).

[2]Knuckey, M. J., and Sayres, E. A.: Personal correspondence.

[3]Skinner, R., and McAlary, J. D.: Nepisiguit Falls, Gloucester and Northumberland Counties, New Brunswick; Geol. Surv., Canada, Paper 52-23.

[4]Shaw, E. W.: Little Southwest Miramichi-Sevogle Rivers Area, New Brunswick; Geol. Surv., Canada, Mem. 197 (1936).

[5]Geol. Surv., Canada: Sevogle, Northumberland and Gloucester Counties, New Brunswick; Geophysics Paper 65.