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Introduction: James township bounded by latitudes 47° 40'N. and 47° 45'16"N. and longitudes 80° 16'30"W. and 80° 24'W. contains the town of Elk Lake, located 37 miles northwest from Cobalt, and 32 miles south from Kirkland Lake.

Mineral Exploration: The Elk Lake area was a centre of prospecting during the late summer of 1906 when native silver was reported. The discovery of native silver in Gowganda in 1908 directed attention away from the Elk Lake area, as did the discovery of gold in the Porcupine area and the resulting staking rush in 1909.

The surface of James township has been carefully prospected. Shafts were sunk on the more promising veins, but there is very little recorded information available about them. The shafts located, with information given in the Annual Reports, Ontario Bureau of Mines, later the Ontario Department of Mines, are listed in the table below.

One Geological Assessment Work Report roughly covering the northern half of lots 7, 8, 9, 10, concession V, has been filed with the Ontario Department of Mines, Toronto and Cobalt. Also several diamond drill Assessment Work Logs have been filed with the Resident Geologist, Ontario Department of Mines, Cobalt.

Properties Shown on map	Location Con. Lot	O.D.M. Reference	Comments
1. Devlin, later Enright	I 1	Vol. XXXVI, pt. 1, p.158	Shaft reported at 200-foot level
2. Patricia	II 2	Vol. XXII, pt. 1, p.124	Shaft reported 44' deep
3. Beacon	I 4	Vol. XXIV, pt. 1, p.126	Depth is 365'
4. Mackenzie	III 4	Vol. XIX, pt. 2, p. 83	Shaft reported 60' deep
5. Elk Lake Discovery	V 1	Vol. XIX, pt. 1, p.115	Shaft reported 150' deep
6. Moose Horn Mines	V 3,4	Vol. XIX, pt. 1, p.116	Shaft reported 125' deep
7. Beaver Auxiliary or Donaldson	V 9	Vol. XXXVI, pt. 1, p.151	Shaft is 670' deep 2nd shaft reported 126' deep
8. Tee Arr or Downey	V 10	Vol. XIX, pt. 1, p.116	Shaft No. 1-170 feet Shaft No. 2-30' pit Shaft No. 3- 8' pit Shaft No. 4-70 feet Approx. 350' adit
9. Ethel Copper Mines Ltd.	VI 1		
10. Elk Lake Cobalt	VI 1	Vol. XVIII, pt. 1, p.126	2 shafts one 40' deep second 25' deep
11. Landrus-Charland	VI 2	Vol. XXIV, pt. 1, p.127	Shaft reported 115' deep
12. Montreal River Int'l Silver	VI 3	Vol. XVI, pt. 2, p.178	2 shafts, each may be 100' deep
13. Prudential	VI 4,5	Vol. XXII, pt. 1, p.124	Shaft reported 125' deep
14. Marvel Mines	V,VI 4		Shaft may be 40' deep
15. Ross and Ballard	VI 6		
16. Motherlode	VI 8	Vol. XIX, pt. 1, p.116	Shaft approx. 100' deep and adit 365'
17. Big Six	VI 9	Vol. XIX, pt. 1, p.115	Shaft reported 194' deep
18. Regal	VI 9	Vol. XXII, pt. 1, p.124	Shaft reported 250' deep
19. Regent	III, IV 1	Vol. XXX, pt. 1, p.124	Inclined shaft reported 30' deep

General Geology: The rock units in James township and their relationships are shown in the legend. A large inclusion of Keewatin metavolcanic rock within the Algoman granite is located in lots 2 and 3, concession VI. Bedded volcanic sedimentary rocks are exposed in the central part of the inclusion whereas amphibolite facies are found near the granite-volcanic inclusion contact. Several smaller basic inclusions, not shown on the map, were seen in lots 9, 10, concession VI.

The granodiorite contains plagioclase, quartz, hornblende and biotite as the major mineral constituents. The potash feldspar content is low and the albite content is high. The texture is medium- to coarse-grained and the structure is slightly foliated due to alignment of the biotite and hornblende minerals. The colour of the granodiorite is generally white. Pink granodiorites are common in some areas.

The age of metamorphism of the Round Lake batholith, of which the granodiorite in James township is a part, measured at Hough Lake, south of Kirkland Lake is 2,405 million years.

Cobalt Group: The lowermost member of the Gowganda Formation is a conglomerate deposited unconformably upon the granodiorite. The thickness of the conglomerate varies from place to place as can be seen on the map. The matrix of the conglomerate varies from an arkose to a greywacke.

Overlying the basal conglomerate is the greywacke member which varies from a dark grey, massive rock to a finely banded rock composed of red and green or grey bands 1/10 inch thick. The massive, dark grey greywacke contains various proportions of pebbles, cobbles and sometimes boulders.

In lots 6, 7, concession I and lots 11, 12, concession IV, the banded greywacke member is thought to develop upward into a predominantly hematitic-rich siltstone member.

The Lorrain Formation is composed of a pink generally fine to medium-grained, arkosic sandstone.

Nipissing Diabase: The diabase intrusion in this area is mainly in the form of a rolling sheet exposed at surface in some sectors only. Dikes are common in areas that are underlain by the diabase sill and are thought to be associated with the intrusion of the sill.

The age of the diabase in Cobalt area is 2,095 million years and the diabase in James township is considered to be the same age.

The sill is mainly quartz diabase rock type having fine-grained facies near the bottom and coarse-grained facies near the top. The late acid phase of the diabase intrusion, granophyre, intrudes and replaces the quartz diabase generally near the top of the sill, but its distribution is not uniform. In lot 5, concession II, the diabase approaches a syenite in composition and appearance because of the granophyre association. Olivine diabase is recognized near the base of the sill.

The greywacke located in lots 5, concession II and VI, show alteration caused by the diabase intrusion. The alteration is in the form of spherules varying from 1/16 inch to 1/4 inch in diameter composed of chlorite and pink albite, the pink colour being caused by hematitic dust.

In some areas where the diabase sill has intruded the banded greywacke, such as lot 11, concession IV, the banded greywacke became semisolid and has flowed as a mass away from the diabase resulting in a brecciated rock.

Pleistocene: The varved clay deposited in a former glacial lake is located along the present course of the Montreal River. Underlying the varved clays are the sands and gravels of the glacial moraines resulting in an excellent aquifer. Three wells have been drilled in James township up to 1962. The wells are shown on the map and the depth of the clay-gravel interface is indicated, although none of the wells reached bedrock.

Structural Geology: The most prominent structural features are the linear topographic features marked on the map. The Montreal River follows the best developed linear topographic feature, but there is no local evidence to indicate faulting.

Faulting is indicated in lot 3, concession VI, by local folding and mylonitization. Brecciation is developed over a width of three feet for more than two hundred feet in lot 7, concession IV, along a prominent north-south linear feature which marks an abrupt change in rock types.

Economic Geology: All mineral showings of economic interest in James township are located within the diabase. A number of shafts, pits and trenches attest to the degree of surface exploration since 1906, but there are presently no producing mines.

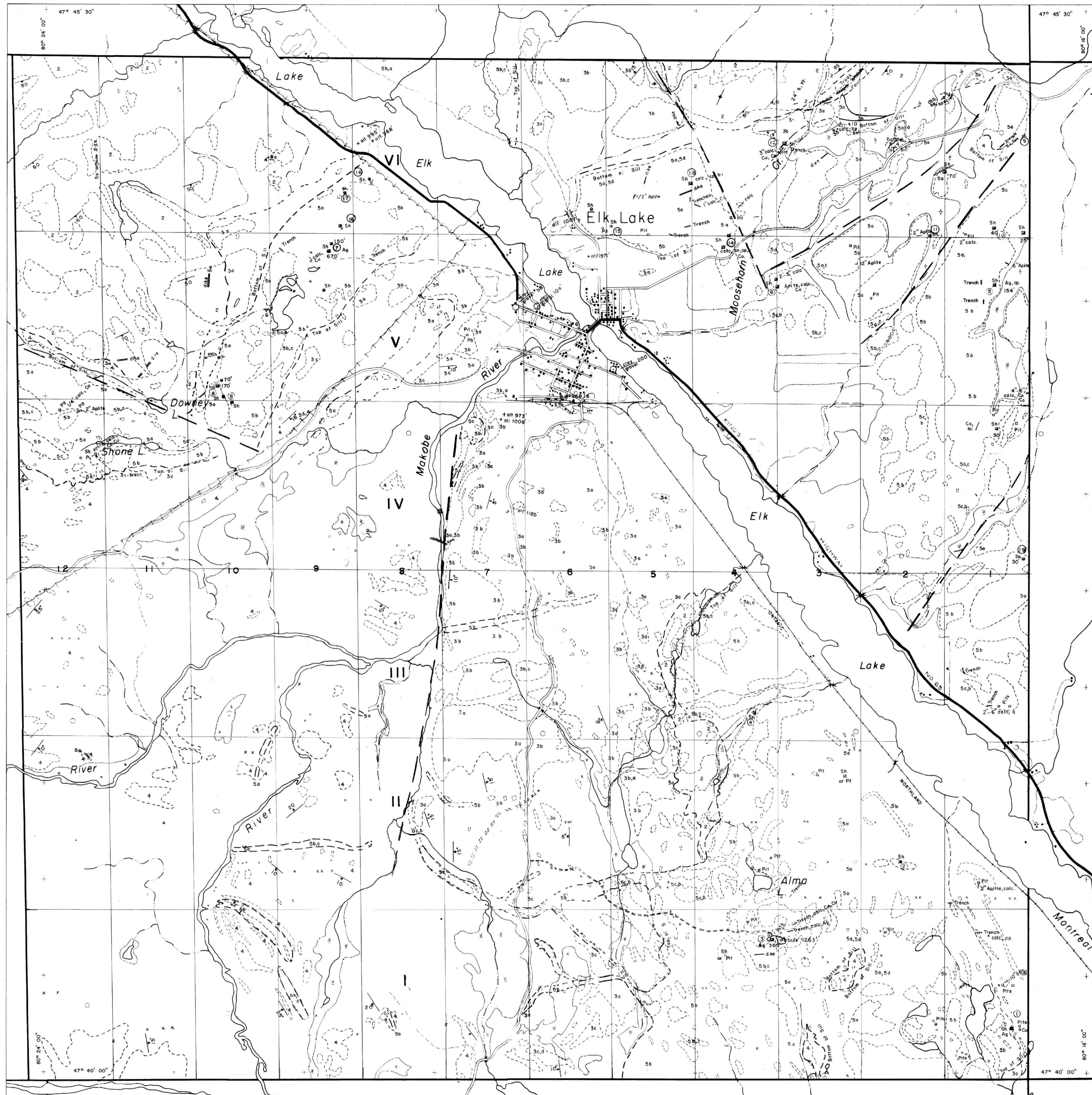
One former producing mine, Ethel Copper Mines Ltd., has an inclined "Adit" on a chalcopryite-bornite-specularite-calcite vein located near and at the base of the diabase. In 1962 the mine produced 241,000 lbs. of copper, 3,577 ounces of silver, and 41 ounces of gold valued at \$80,500. The vein trends in a southwesterly direction. From information available it is not certain if the mineralization is associated with faulting.

A 10-foot deep pit, located in lot 3, concession VI, was sunk on a specularite-chalcopryite-bornite-calcite vein. The vein stopped at the base of the diabase. The bornite mineralization here is in the form of dendritic crystals within a calcite matrix.

A 4 to 6-inch wide calcite vein located in lot 1, concession V, has been explored by a 500-foot trench extending into Thorpe township. The mineralization here is chalcopryite with some niccolite and cobalt bloom.

The silver mineralization in this area is associated with calcite veins often with cobalt mineralization associated. Calcite veins may be barren of silver over much of their length, but have a zone of high grade silver.

The brecciated zone seen in lot 7, concession IV, has rock fragments cemented in a specularite matrix. Assays of this material indicates a trace of silver and a trace of copper.



LEGEND

CENOZOIC*

PLEISTOCENE

Sand, gravel, clay

UNCONFORMITY

PRECAMBRIAN PROTEROZOIC

NIPISSING DIABASE

5 5d Olivine diabase
 5c Granophyre
 5b Medium- to coarse-grained quartz diabase
 5a Fine-grained quartz diabase

INTRUSIVE CONTACT

HURONIAN

COBALT GROUP

Lorrain Formation

4 4 Arkosic sandstone

Gowganda Formation

3 3d Hematitic siltstone
 3c Banded greywacke
 3b Massive greywacke
 3a Conglomerate

UNCONFORMITY

ARCHEAN

ALGOMAN

2 2 Granodiorite

INTRUSIVE CONTACT

KEEWATIN

1 1 Basic metavolcanic and metasedimentary rocks

* Unconsolidated deposits: outcrop area not indicated.

SYMBOLS FOR P. 239 and P. 240

1200' Altitude in feet above mean sea level.	Geological boundary, assumed.
Muskeg or swamp.	Strike and dip; top in direction of arrow.
Boundary of muskeg or swamp.	Strike and dip of gneissosity.
Bridge.	Strike of vertical gneissosity.
Railway.	Fault, defined.
Electric power transmission line.	Fault or lineament, indicated or assumed.
Highway.	Location of mining property.
Motor road.	Shaft, vertical.
Wagon road.	Test pit.
Small rock outcrop.	Open cut, quarry, gravel pit.
Boundary of rock outcrop.	Trench.
Geological boundary, defined.	Adit.
Geological boundary, approximate.	Depth of overburden in feet, approximate.
	Veins.
	Magnetic attraction.

MINERAL OCCURRENCES REFERENCE

Ag Silver	Co Cobalt
ba Barite	Cu Copper
bn Bornite	Pb Lead
calc Calcite	q Quartz
cp Chalcopryite	spec Specularite

LIST OF PROPERTIES

1. Powell property (Devlin)	Co, Ag
2. Cole property (Patricia)	Co, Ag
3. Solomino Gold Mines Ltd. (Beacon)	Ag, Cu
4. Hallinson property (Mackenzie)	Cu, Ag, Co
5. Hansen property (Elk Lake Discovery)	Ag, Cu
6. Min-Ore Mines Ltd. (Mooseroon)	Ag, Cu
7. Murray property (Beaver Auxiliary)	Ag, Co, Ni
8. Bermead Mining Corp. Ltd. (Tee Arr)	Co, Ag, Cu
9. Ethel Copper Mines Ltd.	Co, Ag, Cu
10. S. Welsh property (Elk Lake Cobalt)	Ag, Cu
11. Thorlit Exploration Ltd. (Landrus-Charland)	Cu, Co
12. Montreal River International Silver Mines Ltd.	Co, Ag
13. Prudential Mines Ltd. (Charter cancelled 1953)	Ag, Cu
14. S. Welsh property (Marvel Mines)	Ag, Cu
15. Braune property	Cu
16. Mother Lode mine	Ag, Cu
17. Big Six Silver Cobalt Mines Ltd. (defunct)	Cu, Ag, Co
18. S. Welsh property (Regent)	Ag, Cu

SOURCES OF INFORMATION

Geology by B.E. MacKean and assistants, 1963.
 Assessment Work, 1956, Lenwood Mining Company, James township.
 Base map derived from Forest Resources Inventory map with minor additions by B. MacKean. The locations of lot and concession lines are approximate.
 Geology not tied to surveyed lines.
 Issued 1964.