GEOLOGICAL REPORT

on the

CAMRAY MINES PROPERTY

Theano Point, Lake Superior

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Submitted as Assessment Work by Camray Mines Limited

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INTRODUCTION

The discovery of pitchblende at Theano Point was made on Sept. 8, 1948 by Mr. R. Campbell, prospecting for Camray Prospecting Syndicate. The Camray Mines Ltd. company was later formed to take over the property. Development work on the claims was begun in April, 1949.

LOCATION AND ACCESS

The property is on the east shore of Lake Superior, in Township 29, Range XIV, of the District of Algoma. It includes Theano Point and Ossifrage Island and extends from the lake shore east to Highway 17.

The property is easily reached from Sault Ste. Marie by going north on the above highway for a distance of 72.5 miles, from which point a dirt road continues westward across the property to the shaft. Access by boat is possible, but only when the lake is relatively calm.

PROPERTY

The company holds a single block of 30 claims, Nos. S.S.M. 15649 to S.S.M. 15666 inclusive and S.S.M. 15681 to S.S.M. 15692 inclusive, covering an area of about 1100 acres.
**GEOL OGY OF THEANO POINT**

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**TOPOGRAPHY**

Theano Point is an area of high relief composed chiefly of massive granite and pegmatite. The shore line is precipitous and is cut by deep canyons where wave action has eroded the softer diabase dikes. In the higher ground these canyons continue inland as deep gulleys which are readily observed in aerial photographs of the area.

Large areas of outcrop are exposed in the western part of the claims but there are fewer in the eastern part where the overburden is deeper. Due to the high relief drainage is good, much of the rainfall finds its way to the lake through the gravel in the numerous gulleys. Streams are small and intermittent.

**PLEISTOCENE**

The western part of Theano Point has little or no overburden except in the gulleys. The eastern half of the claims are covered with gravel and boulder clay of sufficient depth to enable the growth of large hardwood trees as well as pine. Some of this gravel and boulder material is terraced and probably represents beaches formed at higher water levels.
KEWEENAWAN DIABASE

Mr. A. H. Lang in his report "The Camray Uranium Discovery" states that the diabase at the discovery cove does not contain olivine and he therefore classes it with the older Keewenawan. The other dikes on the property have similar physical characteristics so it is probable that all are of similar composition.

The strike of these dikes varies considerably; on the basis of size they fall into three categories. The largest dikes bear roughly N 65° W. A number of others of intermediate size have an east-west strike and a third set of short narrow dikes strike either north-east or north-west. The dip of the dikes is towards the North at 70° - 75°. Some of the dikes appear to intersect, but overburden at these points prevents any determination of the age relationships between them.

ALGOMAN (?) GRANITE

The granite of the area is classified as Pre-Huronian and is possibly of Algoman age. It is an orthoclase-rich variety with quartz and mica as minor constituents. There is a fine grained phase and a pegmatitic phase, each of which constitutes about 50% of the granite mass. The boundary of the pegmatite with the finer grained granite is irregular but definite. Numerous fairly flat pegmatite dikes about 6" - 12" in width cut both the finer grained and pegmatitic phases mentioned above. These pegmatite dikes are composed of orthoclase quartz and varying amounts of white mica.

In the north-west part of the property there are a few outcrops of fine-grained white granite. No contact between this white granite and the pink granite was found and it is not apparent whether they are both phases of the same granite or are of different ages.
PRE-ALGOMAN PARAGNEISS

The oldest rock in evidence is a gneiss which in its least altered state appears to be of sedimentary origin. It is altered to biotite, chlorite and other minerals and much of it is granitized. The best exposures of the rock are on the south-west tip of Theano Point. Here the bedding planes strike north-east and dip south at 60°. The paragneiss is distributed throughout the granite in small masses usually not more than 30-40 feet in any dimension.

MINERALIZATION

ALTERATION OF THE GRANITE

The first period of mineralization which occurred was the introduction of iron oxide in the granite and the diabase. The orthoclase of the granite lost its pink colour and was turned to varying degrees of brown. Extreme alteration has changed the granite to a liver-brown colour. The zone of alteration is confined to the granite adjacent to the granite-diabase contact and varies in width from a few inches to four to five feet. In the diabase the alteration is confined to bands 1" or 2" in width along joints and fractures.

PITCHBLENDE

The pitchblende veins are found in the altered granite. There is, however, no relationship between the intensity and extent of alteration and the amount of pitchblende present. The most extensive pitchblende zones have been found at the footwall contact of the diabase dikes. Minor amounts of pitchblende occur also on the hanging wall contacts.
The pitchblende is in veins 1" or less in width and a few feet in horizontal and vertical extent. It fills fractures which developed in the granite, possibly during the shearing of the diabase. The fractures start at the contact and diverge from it at an angle of 30° - 40°, extending from 2 to 5 feet into the granite. The dip of the fractures is nearly vertical. Some pitchblende also occurs as a film on joint planes and seams.

The largest veins are in the coarse and pegmatitic granite since it fractured more extensively than the fine grained granite.

**GANGUE MINERALS**

Small amounts of pyrite and galena accompany the pitchblende, usually filling the extremities of the veins. Calcite and quartz occur as narrow veins in the diabase and granite and also fill fractures in the pitchblende. They often occur as a network of veins at the contact and are probably the last minerals introduced.

**STRUCTURAL CONDITIONS**

A number of post glacial faults can be seen on the property in the form of cliffs a few feet high. Earlier faults are suspected, and on the east side of the property a fault is believed to offset the diabase dikes. This fault trends north-east and displaced the east side to the south a few hundred feet.

The diabase dikes have been sheared in the direction of their strike; very strong shearing has occurred at No. 2 zone in the footwall of the diabase. Moderate shearing has occurred at the No. 1 showing. The pitchblende veins fill fractures which probably were formed during this shearing.
The western part of the claims is covered by a net of 18 triangulation stations which were tied to astronomic north by a polar observation. These stations consist of numbered iron pins and were used as the base for all subsequent surveying.

For geological mapping a base line 9000 feet long was cut due east-west using a transit for control. North-south picket lines were cut at 400 feet intervals along this base line. These picket lines were then chained and stations set at 100' intervals; these stations were later tied in where possible to the road and coast line surveys.

A total of 96,000 feet of picket line was cut and chained.

GEOLOGICAL MAPPING

After completion of the grid lines the property was mapped by four university students. Particular attention was paid to locating and mapping the diabase dikes and examining the contacts. A map on the scale of 200' to 1" was made up as the work progressed and is attached to this report.

GEOPHYSICAL SURVEY

The claims were surveyed with Geiger Counters by the Camray staff and by Mining Geophysics Corp. Ltd. A number of radioactive areas were found and the most important of these are shown on the geological map accompanying this report.
Mr. H. J. Kilgour, BSc., Prof. Eng., is manager of the property. The geology and engineering have been under the supervision of T. R. Heale, B.Sc., Prof. Eng., assisted by E. Walker and G. Goettle, third year university students in mining geology.
DIAMOND DRILLING

Forty three surface diamond drill holes were put down; the total footage amounted to 3086 feet. Three X-ray holes with a total footage of 148' were put down on claim 15665. Three more X-ray holes with a total footage of 169' were put down on claim 15658. The rest, both X-ray and AX core were drilled on claims No. 15649 and 15663.

DEVELOPMENT OF THE PITCHBLENE ZONES to OCTOBER 1, 1949

No. 1 zone - Claim 15663.

This is the original discovery made by Mr. Campbell. There are two pitchblende bearing zones on the footwall of a diabase dike, one, nearest the lake, is 245 feet long; the second, 230 feet to the east, is approximately 85 feet long.

A Warsop plugger was used to trench the longest zone down to the fresh rock, samples were then taken at 5 feet intervals along the zone. For a length of 182' a value of 0.42% was obtained.

The eastern zone was slashed to determine the extent of the pitchblende stringers. About 30 tons of rock were removed and the pitchblende hand sorted.

Diamond drill holes were spaced at 25' centres along the pitchblende zones and were continued to the east of eastern showing for 100 feet.

Following diamond drilling a two compartment inclined shaft 5' x 10' inside the timber was sunk to a depth of 150'. The shaft is located in granite at the east end of the west ore zone and is inclined at 69° to the horizontal. The hangingwall of the shaft is the footwall of the diabase dike. A station was excavated at a depth of 138' and drifting began on October 1, 1949.
No. 2 zone - Claim 15683

This showing is on the south side of the mine road and 1500 feet from Highway No. 17. It is 5800' east of the shaft. Pitchblende veins 1/4" and less in width occur in granite in the footwall of a diabase dike. The veins extend into the granite for a distance of 2-3 feet, and have a vertical extent of 4-5 feet.

The showing was exposed with a bulldozer and the granite was slashed for a length of 200 feet using a compressed air drill and a Warsop. The results of this work were sufficient to warrant further work and an adit was scheduled to begin in October to explore this showing about 60' below the surface exposures.

No. 3 zone - Claim 15649

This showing is in the face of a 30' cliff which is the hanging wall of a diabase dike. Pitchblende occurs sparingly in narrow fractures distributed over 112 feet of the face of the cliff. 30 feet of the best mineralized section was slashed. The newly exposed face was only faintly radioactive and work was therefore discontinued.

No. 4 zone - Claim 15649

Here the granite on the footwall of a diabase dike forms a low cliff 4 to 14 feet high. Radioactivity was found at intervals over a length of 125 feet. At one spot a 3" veinlet of pitchblende and a number of small radioactive fractures were found over a length of 18 feet. The cliff was slashed with a Warsop at all points of radioactivity; the results showed very little pitchblende occurred except in the vicinity of the veinlet mentioned above.

No. 5 zone - Claim 15656

This showing in the footwall of a diabase dike consists of a number of pitchblende veinlets over a length of 35 feet. This zone was benched with a Warsop drill, exposing about 7 main stringers 4'-7' in length and 1/4" to 1/8" in width. This concentration of pitchblende is probably sufficient to constitute ore. A number of other radioactive areas were found east and west of the above zone but blasting into these did not reveal any pitchblende.
No. 6 Zone - Claim 15664

Erosion of a diabase dike has formed a narrow deep gully close to the lake. Radioactivity occurs on the footwall face of this gully over a distance of about 200 feet. No pitchblende stringers have been observed in the accessibly parts of the face and no work has been done to date.

No. 7 Zone - Claim 15664

This zone is on the shore of the lake and consists of radioactivity on the wall of a canyon formed by erosion of a dike. An X-ray drill was used to cross-section the dike. Three holes were put down but no radioactivity was encountered.

No. 8 Zone - Claim 15658

This showing in the north end of the property is on the face of a cliff on the hangingwall side of a dike. Fairly strong radioactivity occurs over a length of 15 feet. Two X-ray drill holes were put down, parallel to and on the contact, in an attempt to cut the pitchblende-bearing zone but no radioactivity was encountered. A third hole was drilled in a similar manner on the footwall contact of second dike nearby, but it did not reveal any radioactivity.

November 16, 1949

T. R. Heale, B.Sc., Prof. Eng.; Geologist.
See accompanying map(s) identified as Slater 0016-A1, #1

Located in the map channel in the following sequence (x)