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REPORT ON GEOCHEMICAL, GEOLOGICAL
AND MAGNETOMETER SURVEYS
ON THE
DEM AND HARD GROUPS 50°/120°N.W., N.E
VANCOUVER ISLAND, B.C.
FOR 92L/11W, 12E

PATHFINDER URANIUM & NICKEL MINES LTD.

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REPORT ON GEOCHEMICAL, GEOLOGICAL

AND MAGNETOMETER SURVEYS

ON THE

DEM AND HARD GROUPS

VANCOUVER ISLAND, B.C.

FOR

PATHFINDER URANIUM & NICKEL MINES LTD.

AGILIS EXPLORATION SERVICES LTD.

NOVEMBER 8, 1968

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Maps	Scale
Surface Plan	1 inch = 400 feet
Geochemical Survey	1 inch = 400 feet
Magnetometer Survey	1 inch = 400 feet
Adit - Plan and Geology	1 inch = 20 feet

REPORT ON GEOCHEMICAL, GEOLOGICAL AND MAGNETOMETER SURVEYS ON THE DEM AND HARD GROUPS VANCOUVER ISLAND, B.C. FOR PATHFINDER URANIUM & NICKEL MINES LTD.

INTRODUCTION:

The Dem Claims held by Hardy Minerals Ltd. consists of a total of 54 contiguous mineral claims situated on the south side of Rupert Inlet at the mouth of the Marble River on northern Vancouver Island, British Columbia.

During August, 1968 exploratory diamond drilling was carried out near an adit on the property. This was discontinued in early September and reconnaissance geochemical, geological and magnetometer surveys were conducted over approximately one-third of the property.

The work was carried out by personnel of Agilis Exploration Services Ltd. under the direction of the writer.

LOCATION AND ACCESS:

The claims extend south for approximately 2 miles from the shore of Rupert Inlet, 11 miles south of Port Hardy, British Columbia. Co-ordinates are 127° 30' west longitude, 50° 34' north latitude.

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Access is by boat from Coal Harbour, a distance by water of approximately 3 miles

PHYSIOGRAPHY:

Relief is low with elevations rising to a maximum of 700 feet above sea-level. Most of the area is heavily timbered. Underbrush is very thick along the shoreline and windfalls create a problem in much of the southern portion of the claims.

Overburden is extensive throughout the property.

CLAIMS:

The property consists of 54 contiguous mineral claims.

Dem 1 - 54 Record No.'s. 20633 - 20686

The surveys were conducted on all or portions of Dem 20, 22, 24, 26, 29 - 39 and 41.

GENERAL GEOLOGY:

Northern Vancouver Island is underlain by a northwesterly trending series of Triassic volcanic and sedimentary rocks. These have been intruded by several small granitic stocks and sills of Jurassic and Tertiary Age, and are capped in small areas by Cretaceous and Tertiary sediments and volcanics.

The Triassic units, as well as being most extensive, are considered the most important economically. Occurrences of copper mineralization are frequent in the volcanics of both the Bonanza Group and the older Karmutsen Formation, and numerous copper-lead-zinc-iron deposits are associated with the Quatsino Limestone, which separates the two volcanic series.

The [illegible]y property is centered along a contact between Quatsino Limestone and volcanics and all the

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work to date has been confined to an examination of this zone.

Outcrops are found mainly in topographically high areas and creek beds near the shoreline. Good exposures can also be found along certain portions of the shoreline.

Two topographically high areas occur in the southwest half of the surveyed area. The first consists of a ridge extending south from the shoreline with numerous high bluffs of fine-grained grey Quatsino Limestone. Bedding appears to be north-northwest dipping gently west.

A similar high ridge of limestone extends south from station 52 on the baseline and appears to have been moved to this position by faulting.

The only outcrops in the northeast half of the surveyed area are confined to fairly high ground near the shoreline and two small creek beds. These outcrops consist of volcanic flows, basaltic to andesitic in composition, commonly dark green, amygdaloidal and similar to those generally classed as the Karmutsen Formation. The trend is difficult to establish but appears to be northwest dipping steeply southwest.

Three possible faults are indicated by lineaments noticeable on aerial photographs. The strongest crosses the property in a N65°W direction and dips steeply southwest. Evidence of this fault can be seen in the adit where the rock is badly sheared for over 100 feet, and in the small creek nearby which follows it for several hundred feet. Two other faults trending N20°W trend into the larger fault and are thought to be responsible for the displacement of the limestone in the southern part of the property.

DETAILED GEOLOGY:

An adit was driven, about 40 years ago, on a zone of quartz-calcite veins containing chalcocite and bornite mineralization approximately 400 feet from the shoreline on the Dem 30 claim. After dewatering, an examination of this adit revealed that the only

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significant mineralization occurs in and around the entrance of the workings, although the tunnel was driven for a total distance of 220 feet.

A shaft measuring 8 feet square was sunk for a distance of 50 feet at the entrance to the adit, presumably on the higher grade mineralization occurring there.

The mineralized veins or lenses appear to have a northwesterly trend but as they are poorly exposed along strike this may be an erroneous conception. A drill hole located in the creek northeast of the tunnel and directed to cross the vein system encountered no copper mineralization within a depth of 42 feet.

Two samples of the mineralization were taken. A 5 foot chip sample from 10' - 15' in the adit returned an assay of 0.8% copper and a grab sample of vein material at the entrance assayed 5.5% copper.

GEOCHEMICAL SURVEY:

Control Grid:

An 8,000 foot base line was established in a southeasterly direction across the property from a point on the shoreline near the limestone-volcanic contact. Cross-lines spaced at 400 foot intervals were run normal to the base line to cover the contact zone.

All lines were established by chain and compass and marked by flagging. Stations were marked at each sample location for future referrence. A total of 15 miles of lines were laid out including 13½ miles of cross-lines along which samples were collected at 200 foot intervals.

Sampling Procedure:

Samples were collected with an auger and were taken wherever possible from the soil horizon immediately underlying the humous layer.

Sample depth averaged 8 - 20 inches but reached a depth of 36 inches in some localities. The most common soil type was a reddish-brown colored sandy clay or sand.

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At each sample location notes were taken regarding soil type, depth taken, vegetation, and topography to be used later in interpretation of results. In addition, any outcrop encountered was noted and later mapped by a geologist.

Geochemical Testing:

Geochemical analysis was carried out by Chemex Labs Ltd. of North Vancouver using the atomic absorption method. Perchloric acid was the extractive medium used. All samples were tested for total copper content and values reported in parts per million (ppm).

Interpretation of Results:

Copper values were plotted on a plan at a scale of 1 inch = 400 feet and contoured at intervals of 50 ppm (parts per million). Background is relatively high and is considered to be 40 - 50 ppm copper. Areas containing copper values of 2 - 3 times background or greater are considered anomalous.

A fairly persistent anomalous zone, up to 500 feet wide, trends in a northeasterly direction for at least 2000 feet from station 4S on the baseline. This anomaly is of considerable interest because it includes the area near the adit which is known to be mineralized and might represent an extension of this zone. Outcrop was encountered on the edge of the anomaly but no mineralization was noticed in it.

Two other anomalies of smaller intensity and extent occur at stations 28S - 32S on the base line and at the eastern end of lines 76S and 80S. Both of these anomalies are in areas devoid of outcrop.

Several isolated high values were obtained but are discounted because they were not supported by samples from surrounding stations.

MAGNETOMETER SURVEY:

Using the grid established for the geochemical survey, a magnetometer survey was carried out in an attempt to delineate, more accurately, the limestone-

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volcanic contact. The instrument utilized was a Sharpe's MF-1 fluxgate magnetometer, and corrections for diurnal variation were accomplished by the use of base stations set up along the base line.

The contact is fairly well defined by a narrow trough of low readings trending almost north-south, except in the vicinity of lines 44S - 56S where much higher readings were obtained. The contact can then be detected again, but displaced to the northeast. This displacement is believed due to the faulting in the area.

No exceptionally high anomalous areas were encountered; the obvious fluctuations can be ascribed to variations in the underlying volcanic material common to this area.

CONCLUSIONS:

Reconnaissance geological and magnetometer surveys on the Dem claims have revealed the presence of a north-south trending contact between Quatsino Limestone in the west and volcanic flows similar to those of the Karmutsen Formation in the eastern part of the property.

Three north-northwesterly trending faults have been postulated on the basis of lineaments detected on air photo interpretation. Evidence of a shear zone associated with one of these faults can be seen in the adit and the neighbouring creek on Dem 30.

The reconnaissance geochemical survey, conducted over approximately one-third of the property, has indicated three copper anomalous zones warranting detailed investigation. The strongest of these trends northeasterly and is a prime target since it appears related to the copper mineralization previously explored on the property. This mineralization was investigated years ago by underground workings, but the trend of the zone was probably never accurately established.

The two other anomalies occuring further south on the property are of secondary importance but warrant further investigation.

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RECOMMENDATIONS:

A detailed geochemical survey on a 100 by 100 foot grid should be conducted over the strongest anomalous zone. This survey should be extended as far as possible northeasterly to test the strike length of the anomaly and northwesterly to delineate the width of the zone.

The other two anomalies should be similarly investigated on a detailed scale, and the reconnaissance survey should be extended over the remainder of the property.

Respectfully Submitted,

Brian Mottershead

Endorsed By

R. H. D. Philp, P. Eng.

AGILIS EXPLORATION SERVICES LTD.

DOMINION OF CANADA:
PROVINCE OF BRITISH COLUMBIA.
TO WIT:

In the Matter of the geochemical, geological and magnetometer surveys over the Dem and Hard Group in the Nanaimo Mining Division.

I, Ronald H. D. Philp

of 812 Blundell Road, Richmond, B. C.

in the Province of British Columbia, do solemnly declare that the following personnel were employed and costs incurred in conducting the above surveys.

R. Philp - supervision, report, 2 days

B. Mottershead - geologist, magnetometer operator - Sept. 12 - Oct. 19, 13½ days

A. Wall - soil sampler - Sept. 12 - Oct. 5, 24 days

D. Weymer - helper - Sept. 12 - Sept. 30, 19 days

Work carried out by Agilis Exploration Services Ltd. at a contract price of $4,000.00.

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 20 day of November 1965, A.D.

R. Philp

Jill Turner

A Commissioner for taking Affidavits for British Columbia or A Notary Public in and for the Province of British Columbia.

SUB-MINING RECORDER

QUALIFICATIONS OF MAGNETOMETER OPERATOR

I, Brian Mottershead do hereby state that:

I am a graduate of the University of Toronto (1965) with a B. Sc. in Geology (Honours), including several courses in geophysics.

I have been employed in the mining industry for more than three years during which time I have conducted several ground and airbourne magnetometer surveys.

December 30th, 1968

Brian Mottershead