010

GEOLOGICAL SURVEY REPORT

SAVANT- HOUGHTON LAKE PROPERTY

CUMBERLAND RESOURCES LIMITED

Houghton Lake Claim Map

Patricia Mining District, Ontario

September 1985,
Blair Kite,
Geologist

HOUGHTON LAKE GEOLOGY

Table of Contents

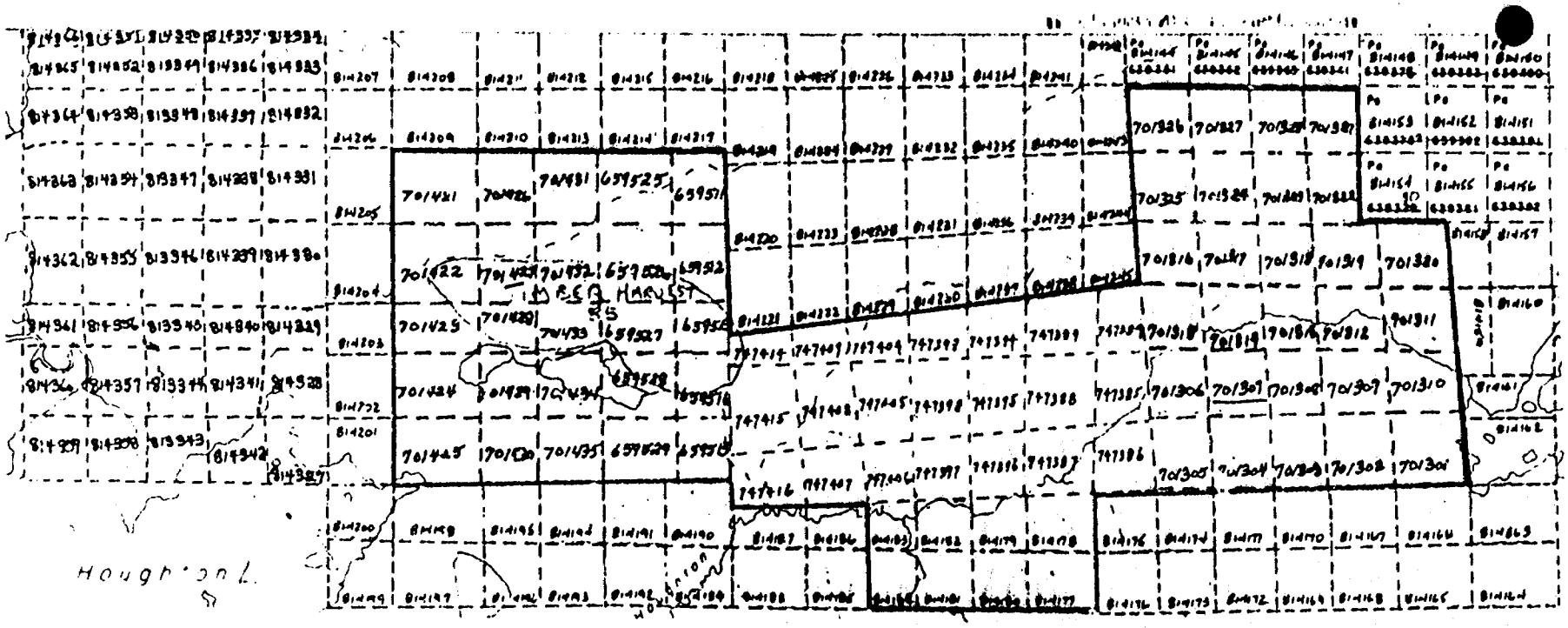
INTRODUCTION

During the months of July and August, 1985, Cumberland Resources Limited of Thunder Bay, Ontario operated a 2-man geological mapping and lithogeochemical sampling crew on 86 claims in the Houghton Lake Area of Ontario. The claims are recorded in the name of Cumberland Resources Limited and owned through a legal joint venture agreement by Cumberland Resources Limited of Thunder Bay, Ontario, 50%; Vestor Explorations Limited, Richmond, British Columbia, 25%; and Redfern Resources Limited, Richmond, British Columbia, 25%. By agreement, Cumberland is the project manager.

This report is prepared to fulfil the requirements for both assessment and the Ontario Mineral Exploration Program grant application.

The field crew consisted of two graduate geologists. Mr B. Kite was the party chief and authored this report. Mr. Greg Charlton served as assistant geologist. The project was supervised by William McCrindle P. Eng., geologist.

The data contained in this report was derived from detailed field mapping on 100 meter spaced lines, from O.G.S. reports and the O.G.S. assessment files in Sioux Lookout. The field mapping was conducted on 110 kms of established grid lines and 16 kms of compass and hipchain lines.



Claim map reference:

- Houghton Lake Claim Map
  M- 2165
  Patricia Mining Division

CUMBERLAND RESOURCES LIMITED

HOUGHTON LAKE AREA

map title: HOUGHTON LAKE PROPERTIES	scale: 1:25,000
	date: August 1985
	B.Kite
	map no.: A

PROPERTY DESCRIPTION

The Houghton Lake Property consisted of 316 contiguous unpatented mining claims of which only 86 were covered in this survey. The balance were allowed to expire on their anniversary of recording ir August of 1985. All claims are held in good standing. The claims are outlined on the Houghton Lake claim map #M-2165.(see map A).

The claim numbers are as follows:

PA 659511 to PA 659513 inclusive
PA 659515 & PA 659516
PA 659525 to PA 659529 inclusive
PA 701301 to PA 701320 inclusive
PA 701322 to PA 701329 inclusive
PA 701421 to PA 701435 inclusive

The above claims were recorded on March 21, and April 6,1983.

PA 747384 to PA 747389 inclusive
PA 747394 to PA 747399 inclusive
PA 747404 to PA 747409 inclusive
PA 747414 to PA 747416 inclusive

The above claims were recorded on December 12, 1983.

PA 814148 & PA 814149
PA 814152 & PA 814153
PA 814177 to PA 814184 inclusive

The above claims were recorded on August 20, 1984.

LOCATION AND ACCESS

The Houghton Lake Property is situated approximately two kilometers north of the Marchington Road, 15 kms north and northwest of the townsite of Savant Lake. (see map B)

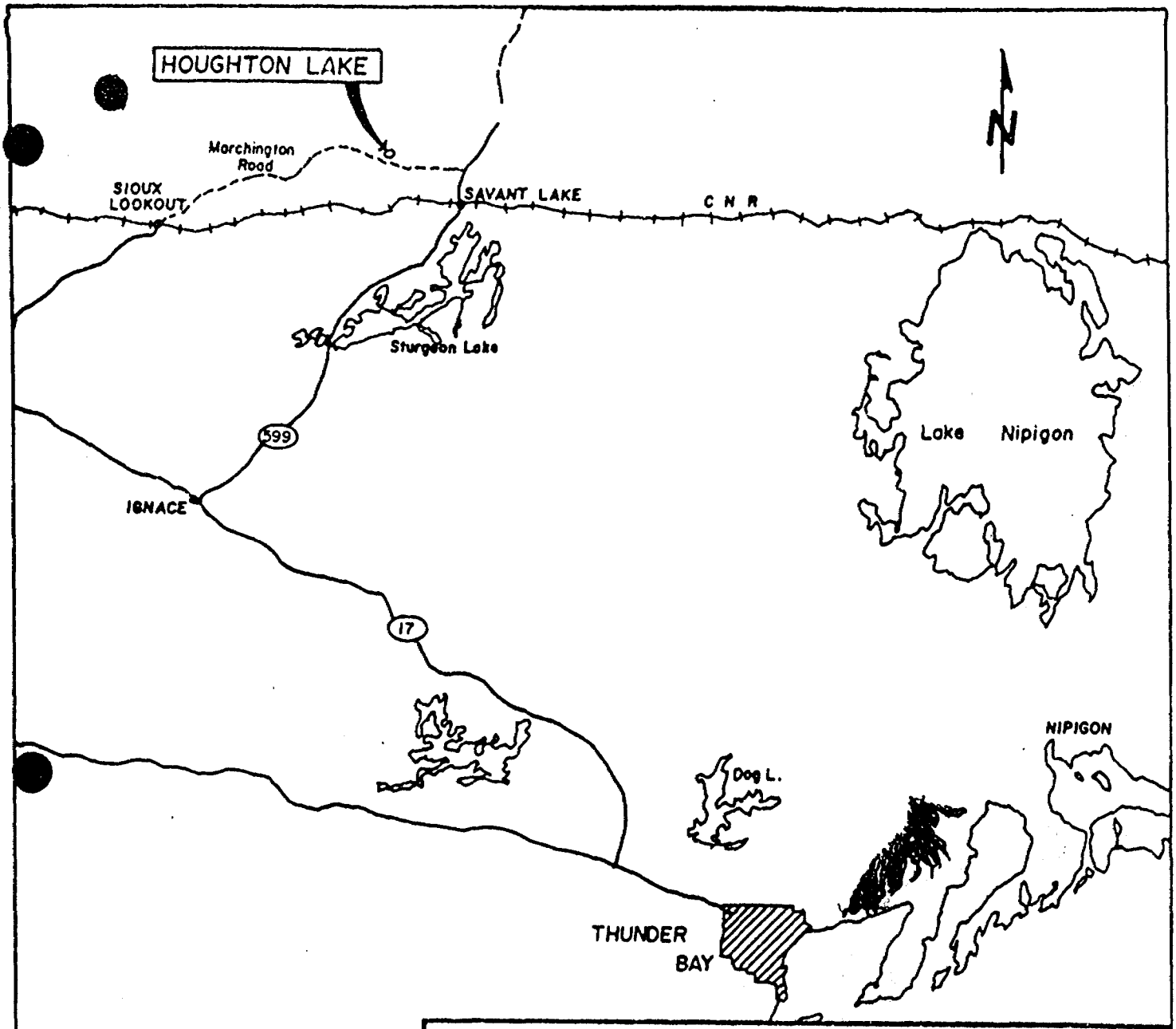
The Houghton Lake Property can be reached by conventional vehicles via gravel pulpwood haul-roads trending north from Marchington Road. The Marchington Road extends eastward from the town of Sioux Lookout to Highway 599, 8 kms north of Savant Lake townsite. The Shoehorm Road runs north from the Marchington Road approximately 7 kms west of Highway 599. To get to the Houghton Property follow the Shoehorn Road north to the Island Lake Road. Follow this Island Lake Road west to the Chum Road. The Chum Road runs through the southern limits of the property.

PHYSIOGRAPHY AND VEGETATION

The properties are located within the Canadian Shield Physiographic Belt of Canada. Relief is low and outcrop exposures are sparce and confined to small moss-covered projections through the glacial overburden. The best outcrop exposures are along logging roads. The eastern portion of the claim group is covered with extensive deposits of glacial till and gravel of unknown thickness.

Water is readily available from Island Lake, Houghton Lake, numerous small ponds and Houghton Creek.

Much of the area was covered with spruce and is presently being logged or regenerated.



CUMBERLAND RESOURCES LIMITED

SAVANT LAKE PROPERTIES

map title: PROPERTY LOCATION MAP	scale: 1: 1,600,000
	date: September 1985
	B.Kite
	map no.: B

HISTORY AND PREVIOUS WORK

The general area has been explored for precious, ferrous and non-ferrous metal bearing deposits since the turn of the century. Subsequent to the discoveries of viable massive sulphide base-metal deposits at Sturgeon Lake during 1969 and 1970, the Savant Lake area was extensively investigated for similar occurrences. Airborne and ground geophysical surveys were followed with the testing of the anomalies by short, mostly isolated diamond drill holes. No economic deposits were discovered.

On the Houghton Lake Property, conductive material was encountered during a horizontal loop electromagnetic survey by Noranda Exploration Company Limited. The east-west conductor axes were not delineated along strike. A single short diamond drill hole intersected massive sulphides containing insignificant base metal values.

Umex Corporation Limited drilled one hole on what is now claim PA 701427 in the western part of the property. The core reportedly contained 46 meters of dacitic tuff and associated volcanogenic sediments all containing disseminated sulphide minerals.

In the summer of 1983, Cumberland Resources Limited conducted a reconnaissance geochemical soil sampling survey along some claim lines. Dighem Corporation of Toronto were contracted to conduct an airborne geophysical survey over the Houghton Property. In 1984, reconnaissance geological mapping located a possible alteration zone which was thought to be associated with volcanogenic massive sulphides. As a result a number of claims were staked to surround previously held ground. A detailed geological survey was conducted to explore the favourable alteration zone.

In February of 1985, Cumberland cut approximately 7 kms of baseline. Grid lines were blazed, chained and stations were marked at 50 metre intervals.

Houghton Lake Geology

REGIONAL GEOLOGY

The Houghton Lake claim group occupies the center area of O.G.S. Map #2424, (Bond 1980); Houghton Lake - Hough Lake. The geology of this area is discussed by Bond in O.G.S. Report #195, Geology of the Houghton Lake-Hough Lake Area(1980).

The claim group is underlain by rocks of the Archean age and according to Bond (1980) belong to the Handy Lake Volcanic Sequence. This sequence is a series of interlayed mafic, felsic and intermediate metavolcanic units with minor intercalated medasedimentary lenses. This is typical of an advanced stage "upper volcanic cycle" in a standard Archean volcanic sequence.

The claim group is underlain by a series of four metavolcanic units with minor interlayed metasediments. These units strike roughly east-west and dip from vertical to steeply north. Top determinations from field observations, O.G.S. and previous assessment work show the younging direction to the north. The stratigraphy from the south claim boundary northward appears as (1) felsic metavolcanics; tuff, lapilli tuff, local flows (2) mafic to intermediate metavolcanics: amygdaloidal pillowed flows, tuffs, lapilli tuff (3) felsic metavolcanics: tuff, lapilli tuff with crystal tuffaceous matrix, crystal tuff, local breccia and debris flow (4) coarse grained, massive mafic metavolcanics.

Each unit is approximately three to four hundred metres thick and is laterally continuous for the length of the claim group.

The metavolcanic rocks are locally intruded by quartz feldspar porphyry, believed to be of sub-volcanic origin.

The claim group is located on the north western limb of a steeply dipping anticline with a northeast trending fold axis.

PROPERTY GEOLOGY

FELSIC VOLCANICS

Felsic metavolcanics in the Houghton Lake claim group appear as two distinct units. They are separated by a unit of mafic to intermediate flows and pyroclastics. Field observation shows the felsic metavolcanics are of rhyolite to rhyodacite composition.

Pyroclastic rock types were classifed by fragment size. Tuff contains fragments less than four millimetres in size. Lapilli tuff contains fragments between four and sixty-four millimetres in size. Tuff breccia contains fragments greater than sixty-four millimetres in size.

The lower felsic metavolcanic unit, at the stratigraphic bottom of the metavolcanic sequence is best observed in the western half of the claim group. In the area south of the Chum Lake Road, near the Doghead Road intersection, this unit is represented by tuff, lapilli tuff and rhyolite flows.

Tuff and lapilli tuff contain white, siliceous, elongate fragments in a very siliceous, very fine grained to aphanetic texture matrix. Colour index for this rock type is M=1 to 2. Fragments are elongate parallel to foliation. Fragments vary from 5 to 15 per cent of the rock's composition. Locally fragments compose up to 70 per cent of the rock. Fragments are fairly well sorted and vary in size from two centimetres to less than half a centimetre. Local alteration minerals, garnet, sericite, carbonate and iron carbonate are present in small amounts. Local pyrite, less than one per cent of the rock, appears as disseminated cubes.

Rhyolite flows are locally flow banded, aphanitic to very fine grained in texture and contain blue quartz eyes. Colour index is M=1. It is bleached white on weathered surface. Locally, sericite and disseminated pyrite, less than one per cent of the rock, are present.

In the centre of the property the predominately pyroclastic upper felsic metavolcanic unit appears. This unit is laterally continuous along the entire claim group. It consists of tuff, lapilli tuff, crystal tuff, local breccia, debris flow, and local rhyolite flows. At the top of this unit a small band of reworked, tuffaceous metasediment with abundant sericite and iron carbonate appears locally. The dominant rock type in this unit contains lapilli sized fragments within a feldspar crystal tuff matrix. Iron carbonate alteration is prevalent in this

unit. Iron carbonate replaces feldspar crystals in the tuffaceous rocks. This alteration could indicate a Mattabi type alteration pipe and massive sulphide deposit at depth. Local, garnetiferous alteration within this unit is observable on claim number PA 701307.

Lapilli tuff contains white siliceous fragments in a fine-grained crystalline, felsic matrix. Sorting varies from well sorted to poorly sorted. Matrix support of fragments is predominant. Bedding up to twenty centimetres wide is not a common feature but appear locally. Fragments are generally one to two centimetres in size and are often elongate, parallel to foliation, but angular fragments are common also. Fragments make up from five to twenty-five per cent of the rocks. The matrix is often foliated, locally sericitic and carbonitized. Feldspar crystals up to two millimetres long making up five to seven per cent of the rock are characteristic. Two to four millimetre blue quartz eyes are also observed.

Tuff contains small, four to eight millimetre, white, siliceous fragments in a siliceous, crystalline matrix. Occasional lapilli sized fragments appear. Feldspar crystals, two to four millimetres in size are common. Quartz eyes two millimetres in size occur locally. Iron carbonate and sericite occur locally.

The predominate rock type in the upper felsic metavolcanic sequence is crystalline tuff. This is a mix of tuff to lapilli sized fragments in a crystal tuff matrix. This rock contains up to twenty per cent two to four millimetre sized feldspar crystals. Fragments vary in size from half a centimetre to six centimetres in size. Average fragment size is about two centimetres. The matrix is fine grained and siliceous. Occasional two millimetre quartz eyes appear. Fragments are often poorly sorted, angular and constitute up to five per cent of the rock. Iron carbonate replacing feldspar in the matrix, is a common alteration mineral. Sericite and trace disseminated sulphide occur locally.

Tuff breccia appears locally. Fragments commonly elongated are closely packed and make up from five to thirty per cent of the rock. Fragments are siliceous and are up to thirty centimetres in length. Less than five per cent feldspar crystals appear in the matrix.

Debris flow appears locally. It is characterized by very poor sorting with polymictic fragments from half a centimetre to thirty centimetres.

TABLE OF FORMATIONS

8 Mafic Intrusive rocks
- 8a Quartz diorite, diorite
- 8b Gabbro

7 Felsic porphyrytic intrusives
- 7a Quartz, feldspar, porphyry
- 7b Feldspar porphyry
- 7c Quartz porphyry

5 Metasediments
- 5d Reworked laminated tuffaceous metasediments

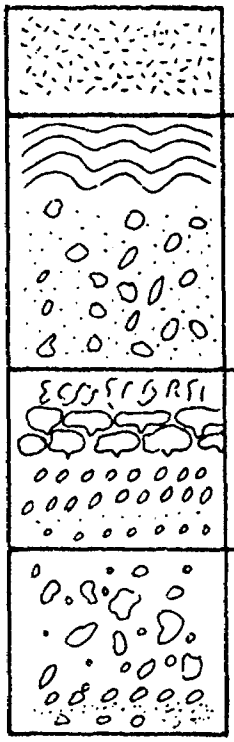
4 Chemical Metasediments
- 4f Chert

3 Felsic Metavolcanics
- 3a Massive flows
- 3b Flow banded flows
- 3c Tuff
- 3d Lapilli tuff
- 3e Tuff breccia
- 3f Crystal tuff
- 3g Lapillistone
- 3h Bedded tuff
- 3j Quartz, quartz-feldspar, feldspar-quartz porphyritic flows
- 3k Debris flow

2 Intermediate Metavolcanics
(Intermediate-Mafic Metavolcanics)
amphibole porphyry, tuff, lapilli tuff, flows, locally feldspar porphyry, chloritic

1 Mafic Metavolcanics
- 1a Fine to medium massive flows
- 1b Feldspar porphyry flows
- 1c Medium to coarse massive flows
- 1d Amygdaloidal flows
- 1e Pillow flows
- 1g Tuff, lapilli tuff, tuff Breccia
- 1j Flow breccia

Figure #1 HOUGHTON LAKE CLAIM GROUP
IDEALIZED STRATIGRAPHIC COLUMN



Upper Mafic Unit
coarse grained, massive flows

Upper Felsic Unit
laminated tuffaceous sediments,
pervasive iron carbonate
tuff, lapilli tuff, crystal lapilli tuff,
debris flow, iron carbonate

Lower Mafic Unit
pillow breccia, amygdaloidal pillowed flows
amphibole porphyritic, mafic- intermediate
lapilli tuff

Lower Felsic Unit
tuff, lapilli tuff, debris flow
rhyolite flow, local "massive sulphide"
alteration; garnet, sericite, staurolite

N

CUMBERLAND RESOURCES LIMITED

HOUGHTON LAKE CLAIM GROUP

map title	scale
IDEALIZED STRATIGRAPHIC COLUMN	SKETCH
	date: September, 1985
	B.Kite
	map no.: Figure #1

INTERMEDIATE METAVOLCANICS

Intermediate metavolcanics occur locally within the two felsic units and extensively with the lower mafic to intermediate metavolcanic unit. Tuff and lapilli tuff are the predominate rock types.

Lapilli tuff contains lithic fragments of similar composition to the matrix. Fragments are crystalline, dark green in colour, sub-round and often elongate. The matrix is fine grained and contains two to six millimetre amphiboles and feldspar crystals. Locally, the amphibole crystals appear as aggregates of fine crystals. Biotite is common in these aggregates. Fragment size varies from half a centimetre to thirty centimetres tut sizes of two to three centimetres are most common. Rare quartz eyes appear in a few locations. The rock is light green on the weathered surface and darker green on a fresh surface.

MAFIC METAVOLCANICS

Two mafic metavolcanic units are present in the Houghton Lake claim group. The lower mafic unit is located between the two felsic metavolcanic sequences. The upper mafic unit occurs at the top of the claim group. It consists of coarse grained, massive flows.

The lower mafic unit contains amygdaloidal pillowed flows, pillow breccia, tuff, and lapilli tuff. It is approximately 200 metres thick and forms a laterally continuous unit through the western two thirds of the claim group. The amygdaloidal pillowed flows are stratigraphically above the tuffaceous component.

Amygdaloidal, pillowed flows appear in the area of the Chum Lake Road and Doghead Road intersection. Pillows are large: one to two metres wide. Top determinations show stratigraphy youngs to the north. Pillows are medium grained and massive. Acicular amphibole crystals up to seven millimetres long constitute twenty to forty per cent of the rock. They appear randomly oriented. Amygdules vary in size from two to six centimetres. They are ellipsoidal, filled with quartz and carbonate and constitute five to seven per cent of the outcrop. Pillow selvages are gossaned and contain pyrite and pryrrhotite. Selvages are dark and amphibole rich.

Pillow breccia appears as a thin, discontinuous unit on top of the amygdaloidal flow.

and lapilli tuff. Characteristically this rock type contains ten to fifteen per cent of two to four millimetre acicular amphibole phenocrysts.

It is light green on the weathered surface, dark green on a fresh surface. Locally, the distinct porphyroblastic texture comes from three millimetre porphyroblasts consisting of aggregates of small amphibole crystals, biotite and chlorite. Two millimetre feldspar phenocrysts are present in the matrix.

Fragments vary from well sorted to poorly sorted. Commonly a bimodal fragment population appears. Approximately half the fragment's are more mafic than the matrix. Fragment size varies from less than a centimetre to greater than forty-five centimetres. Commonly, fragment size is between one and three centimetres, composing five to twelve per cent of the outcrop. Color index varies from M=20 to 35.

At the stratigraphic top of the claim group an irregular, laterally discontinuous unit of coarsened mafic flow appears. This unit is characterised by its massive, homogenous texture. Locally it is amphibole porphyry with phenocrysts up to a centimetre. Local flow breccia is observable.

INTRUSIVE ROCKS

QUARTZ FELDSPAR PORPHYRY

The quartz feldspar porphyry on the Houghton Lake claim group is believed to be a sub-volcanic intrusive unit. Small dykes of quartz feldspar porphyry appear throughout the stratigraphy. Longer intrusions appear south of the small lakes in the west part of the claim group and south of the Chum Lake Road near the Doghead Road intersection.

Quartz eyes, dark blue and grey in colour, and four millimetre euhedral feldspar crystals are characteristic of this unit. The matrix is siliceous, aphanetic and locally weakly foliated. Sericite and trace disseminated suphide occur locally. Phenocrysts make up ten to twenty per cent of the rock. Iron carbonate occurs locally.

METASEDIMENTS

Reworked tuffaceous metasediments:

A thin, discontinuous unit of tuffaceous metasediments appears stratigraphically below the upper mafic metavolcanic unit at the east end of the claim group. This metasedimentary unit is thinly bedded, (less than one centimetre) and appears complexly folded. Iron carbonate is pervasive and forms alternating layers with the tuffaceous material. Sericite appears within the tuffaceous layers.

STRUCTURE

Folding and Faulting:

The entire claim group lies on the northwestern limb of a major anticline. This fold has a northeast steeply plunging fold axis. There is no apparent second generation folding within the claim group. A small fault has been interpreted from geology and aeromagnetic data. It lies east of the small lakes and trends northeast.

Foliation and Bedding:

Foliation strikes east-west and dips from vertical to locally steeply north or south. Bedding strikes approximately 100 to 110 where observed and dips parallel to the foliation.

ALTERATION AND MINERALIZATION

Alteration appears in the upper felsic unit, the lower mafic unit and the lower felsic unit on this property.

In the area around the Doghead Road - Chum Lake Road intersection, interpillow alteration was identified by J.M. Franklin and H. Poulson (1985 Pers. Comm.). Pyrite and pyrrhotite mineralization within pillow selvages in the lower mafic unit indicates interpillow alteration. Franklin suggests this alteration is indicative of mineralizing fluids moving through the open space between pillows. Weak massive sulphide type alteration occurs directly below this area. Rare garnet, sericite and possibly staurolite appear. Geophysical anomalies are associated with the interpillow alteration and possibly at the contact between the lower felsic and lower mafic units.

On claim PA 701307 an outcrop of coarse garnet-biotite-magnetite in felsic lapilli tuff occurs in the lower felsic unit. This assemblage is also indicative of massive sulphide alteration. This alteration appears in the upper felsic unit.

Iron carbonate is the predominant alteration mineral in the upper felsic unit. Iron carbonate replaces feldspar crystals in lapilli crystal tuff and crystal tuff. Iron carbonate is found in the matrix of tuffaceous rocks. Pervasive iron carbonate within tuffaceous metasediments occurs at the top of the upper felsic unit. The presence of this mineral is indicative of Mattabi type massive sulphide alteration. Very little sulphide mineralization appears with the claim group. A trace of disseminated pyrite occurs locally within the felsic units. Pyrite and pyrrhotite occur within the lower felsic unit.

CONCLUSIONS

The Houghton Lake claim group is underlain by a sequence of felsic and mafic metavolcanic units. The metavolcanic units are roughly continuous along the claim group.

Two targets for further exploration work have been identified. The first target, a massive sulphide possibility, is located at the intersection of Doghead Road and Chum Lake Road. Interpillow alteration, with a pillowed flow (Franklin, pers. comm. 1985), geophysical anomalies and the geological environment make this an interesting target.

The second target, of lower priority, is also a massive sulphide possiblity. Iron carbonate alteration in the upper felsic unit may be indicative of a Mattabi massive sulphide type alteration and mineralization at depth.

RECOMMENDATIONS

1. Lithogeochemical sampling and computer assisted statistical analysis for Na_2O, Cu, Zn, Ag, MnO and Au. Sample interval should be fifty metres.

2. Follow up of Franklin's July 1985 visit to the property. Age dating of quartz feldspar porphyry and metavolcanics. Europium dates should be obtained as indicated.

3. Detailed geological mapping as indicated from lithogeochemical program and the airborne geophysics.

4. Initial diamond drill program (500 metre minimum) to follow up any geochemical anomalies.

BIBLIOGRAPHY

1. Bond, W.D. 1980: Geology of the Houghton - Hough Lakes Area, Ontario Geological Survey Report #195.

2. Fraser, D.C. 1984: Dighem iii survey of the Savant Lake Area for Cumberland Resources Limited. Company report in assessment files, Sioux Lookout, Ontario.

3. Assessment files at the Sioux Lookout Mining Recorder's office, Ministry, Mines and and Northern Affairs.

4. Franklin, J.M., and Poulson, H.; Geological Survey of Canada, property visitation July 1985.

QUALIFICATIONS

I, Blair Kite, of 74 Winnipeg Avenue, Thunder Bay, Ontario hereby certify:

1. I am a graduate of Lakehead University (1981) and hold an Honours B.Sc.degree in geology.

2. I have been employed in my profession by various mining companies during university and for three years since graduation.

3. I am presently employed as a geologist with Cumberland Resources Limited, Thunder Bay, Ontario.

4. The information contained in this report was obtained from personal field traversing and the various publications listed in the bibliography.

5. I am a member of the Canadian Institute of Mining and Metallurgy.

dated at Thunder Bay, Ontario

September 24, 1985

Blair Kite

Blair Kite

Geologist

P.D.

900

Mining Lands Section

File No 28521

Control Sheet

TYPE OF SURVEY

____ GEOPHYSICAL

✓ GEOLOGICAL

____ GEOCHEMICAL

____ EXPENDITURE

MINING LANDS COMMENTS:

L. Hurst

Signature of Assessor

Oct 23/85

Date

Ontario

Ministry of Natural Resources

File _____

GEOPHYSICAL – GEOLOGICAL – GEOCHEMICAL TECHNICAL DATA STATEMENT

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) GEOLOGICAL

Township or Area HOUGHTON LAKE

Claim Holder(s) CUMBERLAND RESOURCES LTD

Survey Company CUMBERLAND R.L.

Author of Report R. KITS

Address of Author c/o CUMBERLAND R.L. 74 WINNIPEG AVE

Covering Dates of Survey JULY 1/85 - AUGUST 1/85 THUNDER BAY
(linecutting to office)

Total ~~Miles~~ of Line Cut 110 KMS.

SPECIAL PROVISIONS CREDITS REQUESTED		DAYS per claim.
ENTER 40 days (includes line cutting) for first survey.	Geophysical	
	–Electromagnetic	
	–Magnetometer	
	–Radiometric	
ENTER 20 days for each additional survey using same grid.	–Other	
	Geological	40
	Geochemical	

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer _____ Electromagnetic _____ Radiometric _____
(enter days per claim)

DATE: Oct. 3/85 SIGNATURE: _____
Author of Report or Agent

Res. Geol. _____ Qualifications This file

Previous Surveys

File No.	Type	Date	Claim Holder

MINING CLAIMS TRAVERSED
List numerically

If space insufficient, attach list

PA 814148 (prefix) (number)
814149
814152
814153
814177
814178
814179
814180
814181
814182
814183
814184
PLUS
PA 659511 et al (25cl) } list attached
PA 701301 et al (28cl) }
PA 747384 et al (21cl) }

RECEIVED
OCT 17 1985
MINING LANDS SECTION

TOTAL CLAIMS 86

837 (5/79)

2

HOUGHTON LAKE - SAVANT GROUP #2

Location: Houghton Lake M-2165, Patricia Mining Division, Ontario
Ownership: by agreement dated June 1/83
Cumberland Resources Ltd. 50%
Redfern Resources Ltd. 25%
Vestor Exploration Ltd. 25%
Registered: in name of Cumberland Resources Ltd. May 5/83
Recorded: April 6/83

PA659511
PA659512
PA659513

PA659515
PA659516

PA659525
PA659526
PA659527
PA659528
PA659529

PA701421
PA701422
PA701423
PA701424
PA701425
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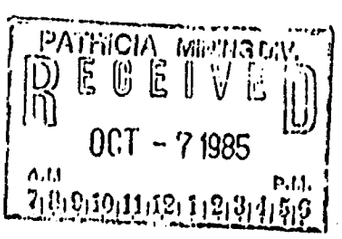

ISLAND LAKE - SAVANT GROUP #3

Location: Houghton Lake M-2165, Patricia Mining Division, Ontario
Ownership: by agreement dated June 1/83
Cumberland Resources Ltd. 50%
Redfern Resources Ltd. 25%
Vestor Exploration Ltd. 25%
Registered: in name of Cumberland Resources Ltd. May 5/83
Recorded: March 21/83

PA701301
PA701302
PA701303
PA701304
PA701305
PA701306
PA701307
PA701308
PA701309
PA701310
PA701311
PA701312
PA701313
PA701314
PA701315
PA701316
PA701317
PA701318
PA701319
PA701320

PA701322
PA701323
PA701324
PA701325
PA701326
PA701327
PA701328
PA701329

SAVANT - BAY GROUP

Location: Houghton Lake M2165, Patricia Mining Division, Ontario
Ownership: by agreement dated June 1/83 and revised Schedule A dated Nov. 1/84
Cumberland Resources Limited 50%
Redfern Resources Ltd. 25%
Vestor Exploration Ltd. 25%
Registered: in name of Cumberland Resources Ltd. March 26/84
Recorded: December 12, 1983

PA747384
PA747385
PA747386
PA747387
PA747388
PA747389

PA747394
PA747395
PA747396
PA747397
PA747398
PA747399

PA747404
PA747405
PA747406
PA747407
PA747408
PA747409

PA747414
PA747415
PA747416

Ministry of Northern Affairs and Mines
Ontario

Technical Assessment Work Credits

File: 2.8521

Date: 1985 11 08

Mining Recorder's Report of Work No.: 85-177

Recorded Holder: CUMBERLAND RESOURCES LIMITED

Township or Area: HOUGHTON LAKE AREA

Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	PA 659511 to 13 inclusive 659515-16-25-26-27-29 701421 to 433 inclusive 701435 701301 to 320 inclusive 701322 to 329 inclusive 747384 to 389 inclusive 747394 to 399 inclusive 747404 to 409 inclusive 747414 to 416 inclusive
Electromagnetic _____ days	
Magnetometer _____ days	
Radiometric _____ days	
Induced polarization _____ days	
Other _____ days	
Section 77 (19) See "Mining Claims Assessed" column	
Geological 40 days	
Geochemical _____ days	
Man days [ ] Airborne [ ]	
Special provision [X] Ground [ ]	
[ ] Credits have been reduced because of partial coverage of claims.	
[ ] Credits have been reduced because of corrections to work dates and figures of applicant.	

Special credits under section 77 (16) for the following mining claims

20 DAYS	10 DAYS
PA 659528	PA 701434

No credits have been allowed for the following mining claims

[ ] not sufficiently covered by the survey [ ] insufficient technical data filed

The Mining Recorder may reduce the above credits if necessary in order that the total number of approved assessment days recorded on each claim does not exceed the maximum allowed as follows: Geophysical - 80; Geological - 40; Geochemical - 40; Section 77(19) - 60.

828 (85/9)

27

R. Pichette.
Mining Lands Branch 85-125

2.8521

Ontario Ministry of Natural Resources

Report of Work
(Geophysical, Geological, Geochemical and Expenditures)

ONTARIO MINISTRY OF NATURAL RESOURCES
AUG 12 1985
SIOUX LOOKOUT

Instructions: - Please type or print.
- If number of mining claims traversed exceeds space on this form, attach a list.
Note: - Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
- Do not use shaded areas below.

Type of Survey(s): GEOLOGICAL
Township or Area: HOUGHTON LAKE M-2165
Claim Holder(s): CUMBERLAND RESOURCES LIMITED
Prospector's Licence No.: T-1303
Address: 74 WINNIPEG AVE, THUNDER BAY ONT. P7B 3P9
Survey Company: CUMBERLAND RES. LTD.
Date of Survey (from & to): 01 07 85 (Day Mo Yr) — 01 08 85 (Day Mo Yr)
Total Miles of line Cut: —
Name and Address of Author (of Geo Technical report): BLAIR KITE - CUMBERLAND RES. LTD. 74 WINNIPEG AVE. THUNDER BAY

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
For each additional survey: using the same grid: Enter 20 days (for each)	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	20
	Geochemical	

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical - Electromagnetic	
	Geophysical - Magnetometer	
	Geophysical - Radiometric	
	Geophysical - Other	
	Geological	
	Geochemical	

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys.	Electromagnetic	
	Magnetometer	
	Radiometric	

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.	Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
P.A.	814148				
	814149				
	814152				
	814153				
	814177				
	814178				
	814179				
	814180				
	814181				
	814182				
	814183				
	814184				

RECEIVED
PATRICIA MINING DIV.
AUG 12 1985
A.M. 7 8 9 10 11 12 1 2 3 4 5 6 P.M.

Expenditures (excludes power stripping)

Type of Work Performed:
Performed on Claim(s):

Calculation of Expenditure Days Credits
Total Expenditures: $ ÷ 15 = Total Days Credits

Instructions: Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Total number of mining claims covered by this report of work: 12

To 814144 Report of Work will be submitted within the 60 day period.

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
240	August 12/85	
	Date Approved as Recorded: 85.11.8	Branch Director

Date: Aug. 8/85
Recorded Holder or Agent (Signature): WMCrindle

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: WILLIAM McCRINDLE % CUMBERLAND RES. LTD. 74 WINNIPEG AVE THUNDER BAY.

Date Certified: Aug. 8/85
Certified by (Signature): WMCrindle

1362 (81/9)

28

Ontario Ministry of Natural Resources

Report of Work
(Natural, Geological, Geophysical and Expenditures)

Mining Act

28521

#85-177

Instructions: - Please type or print
If number of mining claims traversed exceeds space on this form, attach a list.
Note - Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns.
- Do not use shaded areas below.

Type of Survey(s): GEOLOGICAL

Township or Area: HOUGHTON LAKE M-2165

Claim Holder(s): CUMBERLAND RESOURCES LIMITED

Prospector's Licence No.: T-1303

Address: 74 WINNIPEG AVE. THUNDER BAY

Survey Company: CUMBERLAND RES. LTD.

Date of Survey (from & to): 01 Day 07 Mo. 85 Yr. / 01 Day 08 Mo. 85 Yr.

Total Miles of line Cut: 110 KMS

Name and Address of Author (of Geo-Technical report): WM B. KITE. % 74 WINNIPEG AVE.

Credits Requested per Each Claim in Columns at right

Special Provisions		Days per Claim
For first survey: Enter 40 days. (This includes line cutting)	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
For each additional survey using the same grid: Enter 20 days (for each)	- Other	
	Geological	40
	Geochemical	

Man Days		Days per Claim
Complete reverse side and enter total(s) here	Geophysical	
	- Electromagnetic	
	- Magnetometer	
	- Radiometric	
	- Other	
	Geological	
	Geochemical	

Airborne Credits		Days per Claim
Note: Special provisions credits do not apply to Airborne Surveys	Electromagnetic	
	Magnetometer	
	Radiometric	

Expenditures (excludes power stripping)

Type of Work Performed

Performed on Claim(s)

Calculation of Expenditure Days Credits

Total Expenditures $ ÷ 15 = Total Days Credits

Instructions
Total Days Credits may be apportioned at the claim holder's choice. Enter number of days credits per claim selected in columns at right.

Date: Oct. 3/85

Recorded Holder or Agent (Signature): WMCendle

Mining Claims Traversed (List in numerical sequence)

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
PA	659511 et al. (list attached for 25 cl.	
P.A.	701301 et al. (list attached for 28 cl.)	

Mining Claim Prefix	Mining Claim Number	Expend. Days Cr.
PA.	747384 et al (list attached for 28 cl.)	

RECEIVED
OCT - 7 1985
M.N.R.
THUNDER BAY

Pa. 659511

Total number of mining claims covered by this report of work: 74

For Office Use Only

Total Days Cr. Recorded	Date Recorded	Mining Recorder
2960	Oct. 7, 1985	M. G. Warman
	Date Approved as Recorded	Branch Director
	Oct. 8/85	R. Lamond

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying: W. MCCENDLE 74 WINNIPEG AVE. THUNDER BAY. ONT.

Date Certified: Oct-3/85

Certified by (Signature): WMCendle

29

0052 (84/10)

2 8 5 0 1

639511	✓			701308	✓			147347	✓		
12	✓			9	✓			404	✓		
13	✓			10	✓			5	✓		
515	✓			11	✓			6	✓		
16	✓			12	✓			7	✓		
525	✓			13	✓			8	✓		
26	✓			14	✓			9	✓		
27	✓			15	✓			414	✓		
28	1/2			16	✓			15	✓		
29	✓			17	✓			16	✓		
701421	✓			18	✓			814148	✓		
22	✓			19	✓			47	✓		
23	✓			20	✓			52	✓		
24	✓			322	✓			53	✓		
25	✓			23	✓			77	✓		
26	✓			24	✓			78	✓		
27	✓			25	✓			79	✓		
28	✓			26	✓			80	✓		
29	✓			27	✓			81	✓		
30	✓			28	✓			82	✓		
31	✓			29	✓			83	✓		
32	✓			747384	✓			84	✓		
33	✓			85	✓						
34	3/4			86	✓						
35	✓			87	✓						
701301[illegible]	✓			88	✓						
2 [illegible]	✓			89	✓						
3	✓			394	✓						
4	✓			95	✓						
5	✓			96	✓						
6	✓			97	✓						
7	✓			98	✓						

REGISTERED

October 1, 1985 Report Of Work #125

Cumberland Resources Limited
74 Winnipeg Avenue
Thunder Bay, Ontario
P7B 3P9

Attention: William McCrindle

Dea

Dear Sirs:

RE: Mining Claims PA 814148, et al,
in the Area of Houghton Lake

I have not received the reports and maps (in duplicate) for the Geological Survey on the above-mentioned claims.

As the assessment "Report of Work" was recorded by the Mining Recorder on August 12, 1985 the 60 day period allowed by Section 77 of the Mining Act for the submission of the technical reports and maps to this office will expire on October 11, 1985.

If the material is not submitted to this office by October 11, 1985 I will have no alternative but to instruct the Mining Recorder to delete the work credits from the claim record sheets.

For further information, please contact Mr. Arthur Barr at (416)965-4088.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-4888

AB/mc

cc: Mining Recorder - Sioux Lookout, Ontario

Ministry of Natural Resources

Ontario

1985 11 08

Your File: 85-177
Our File: 2.8521

Mining Recorder
Ministry of Northern Affairs and Mines
P.O. Box 309
Sioux Lookout, Ontario
P0V 2T0

Dear Sir:

Enclosed are two copies of a Notice of Intent with statements listing a reduced rate of assessment work credits to be allowed for a technical survey. Please forward one copy to the recorded holder of the claims and retain the other. In approximately fifteen days from the above date, a final letter of approval of these credits will be sent to you. On receipt of the approval letter, you may then change the work entries on the claim record sheets.

For further information, if required, please contact Mr. R.J. Pichette at 416/965-4888.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3

SH/mc

Encls.

cc: Cumberland Resources Limited
74 Winnipeg Avenue
Thunder Bay, Ontario
P7B 3P9

Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

845

32

Ministry of Natural Resources

Ontario

Notice of Intent

for Technical Reports

1985 11 08

2.8521/85-177

An examination of your survey report indicates that the requirements of The Ontario Mining Act have not been fully met to warrant maximum assessment work credits. This notice is merely a warning that you will not be allowed the number of assessment work days credits that you expected and also that in approximately 15 days from the above date, the mining recorder will be authorized to change the entries on his record sheets to agree with the enclosed statement. Please note that until such time as the recorder actually changes the entry on the record sheet, the status of the claim remains unchanged.

If you are of the opinion that these changes by the mining recorder will jeopardize your claims, you may during the next fifteen days apply to the Mining and Lands Commissioner for an extension of time. Abstracts should be sent with your application.

If the reduced rate of credits does not jeopardize the status of the claims then you need not seek relief from the Mining and Lands Commissioner and this Notice of Intent may be disregarded.

If your survey was submitted and assessed under the "Special Provision-Performance and Coverage" method and you are of the opinion that a re-appraisal under the "Man-days" method would result in the approval of a greater number of days credit per claim, you may, within the said fifteen day period, submit assessment work breakdowns listing the employees names, addresses and the dates and hours they worked. The new work breakdowns should be submitted direct to the Land Management Branch, Toronto. The report will be re-assessed and a new statement of credits based on actual days worked will be issued.

1985 12 04

Your File: 85-177
Our File: 2.8521

Mining Recorder
Ministry of Northern Development and Mines
Court House
P.O. Box 309
Sioux Lookout, Ontario
P0V 2T0

Dear Sir:

RE: Notice of Intent dated November 25, 1985
Geological Survey on Mining Claims PA 659511, et al, in the Area of Houghton Lake

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The assessment work credits, as listed with the above-mentioned Notice of Intent, have been approved as of the above date.

Please inform the recorded holder of these mining claims and so indicate on your records.

Yours sincerely,

S.E. Yundt
Director
Land Management Branch

Whitney Block, Room 6643
Queen's Park
Toronto, Ontario
M7A 1W3
Phone:(416)965-4888

SH/mc

cc: Cumberland Resources Limited
Thunder Bay, Ontario

Resident Geologist
Sioux Lookout, Ontario

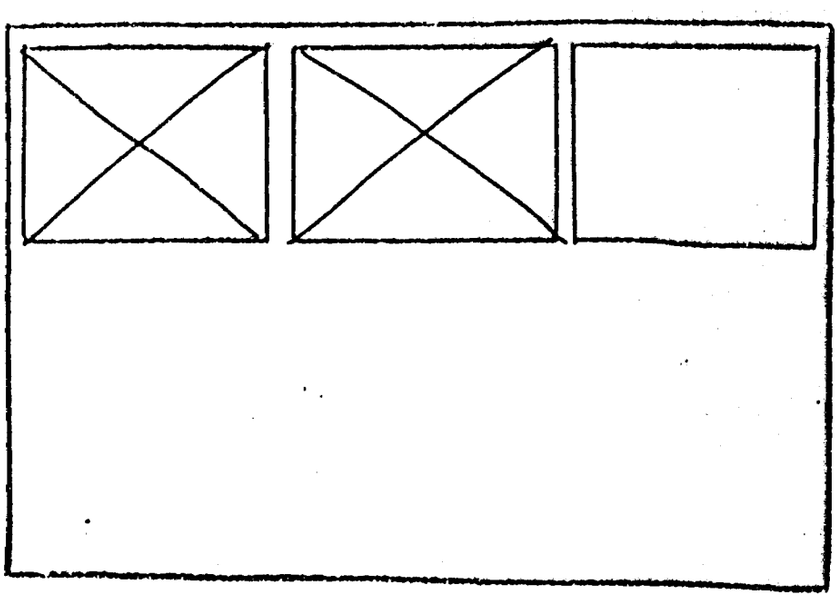
Mr. G.H. Ferguson
Mining & Lands Commissioner
Toronto, Ontario

Encl.

SEE ACCOMPANYING MAP(S) IDENTIFIED AS

52J/07SW-0028#F1&2

LOCATED IN THE MAP CHANNEL IN THE FOLLOWING SEQUENCE (X)



N

LEGEND

MAFIC INTRUSIVE ROCKS

8 [8] 8a Quartz diorite, diorite

8c Gabbro

FELSIC PORPHYRITIC INTRUSIVES

7 [7] 7a Quartz - feldspar porphyry
7b Feldspar porphyry
7c Quartz porphyr

FELSIC METAVOLCANICS

3 [3] 3a Massive flows
3b Flow banded flows
3c Tuff
3d Lapilli tuff
3e Tuff breccia
3f Crystal tuff
3g Lapillistone
3h Bedded tuff
3j Quartz, quartz-feldspar, feldspar quartz porphyritic flows

INTERMEDIATE METAVOLCANICS

2 [2] 2a Massive flows
2b Porphyritic (feldspar) flows
2c Tuff
2d Lapilli tuff
2e Tuff breccia

2f Crystal tuff
2g Bedded tuff
2h Mixed intermediate and mafic, with tuffaceous metasediments

MAFIC METAVOLCANICS

1 [1] 1a Fine to medium grained massive flows
1b Porphyritic (feldspar) flows
1c Medium to coarse grained massive flows
1d Amygdaloidal flows
1e Pillowed flows
1g Tuff, lapilli tuff, tuff breccia
1j Flow- breccia

52J/07SW-0028#1

METRIC GRID 100M. LINE SPACING
Symbols and Mineral Abbreviations: See Eastern Portion.

28521
dup

CUMBERLAND RESOURCES LIMITED

SAVANT LAKE PROJECT
HOUGHTON LAKE - ISLAND LAKE GROUPS

map title: GEOLOGICAL MAP

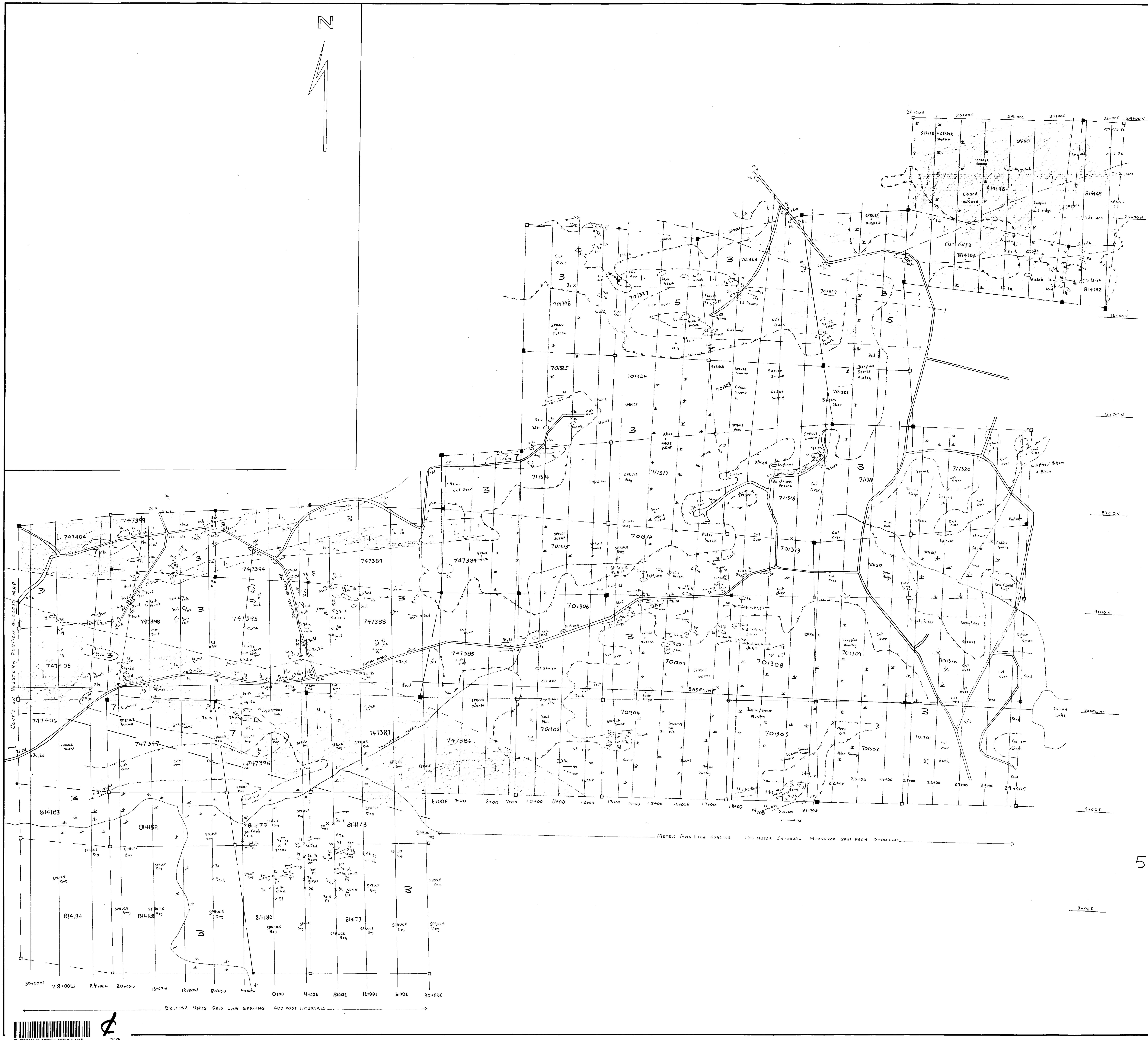
WESTERN PORTION

scale: 1:5000

date: August 1985

Geology by: BLAIR KITE

map no.



LEGEND

MAFIC INTRUSIVE ROCKS

8 — 8a Quartz diorite, diorite
8c Gabbro

FELSIC PORPHYRITIC INTRUSIVES

7 — 7a Quartz - feldspar porphyry
7b Feldspar porphyry
7c Quartz porphyr

METASEDIMENTS

5 — 5a Sandstone
5b Siltstone, claystone
5c Cherty siltstone
5d Tuffaceous metasediments
5e Garnetiferous metasediments
5f Argillite
5g Graywacke
5h Sericite schist

CHEMICAL METASEDIMENTS

4 — 4f Chert

FELSIC METAVOLCANICS

3 — 3a Massive flows
3b Flow banded flows
3c Tuff
3d Lapilli tuff
3e Tuff breccia
3f Crystal tuff
3g Lapillistone
3h Bedded tuff
3j Quartz, quartz - feldspar, feldspar quartz porphyritic flows

INTERMEDIATE METAVOLCANICS

2 — 2a Massive flows
2b Porphyritic (feldspar) flows
2c Tuff
2d Lapilli tuff
2e Tuff breccia
2f Crystal tuff
2g Bedded tuff
2h Mixed intermediate and mafic, with tuffaceous metasediments

MAFIC METAVOLCANICS

1 — 1a Fine to medium grained massive flows
1b Porphyritic (feldspar) flows
1c Medium to coarse grained massive flows
1d Amygdaloidal flows
1e Pillowed flows
1g Tuff, lapilli tuff, tuff breccia
1j Flow breccia

80° 80° Bedding, inclined, vertical, graded
80° Foliation, inclined, vertical
Shear
Fault
80° Drag fold with plunge
5-1 Bedrock grab sample and sample number

act actinolite
cpy chalcopyrite
gt garnet
hbd hornblende
mag magnetite
po pyrrhotite
py pyrite
qe quartz eyes
carb carbonate
fecarb iron carbonate
gnt garnet

Road
Trail
Creek

Cut-over area
Claim part, location verified, location unverified
Claim Line
Swamp
outcrop

230 DIGHEM AEM conductor
HEM conductor axis - defined
HEM conductor axis - possible
Diamond drilled hole, surface projection

52J/07SW-0028,#2

28521

CUMBERLAND RESOURCES LIMITED

SAVANT LAKE PROJECT
HOUGHTON LAKE - ISLAND LAKE GROUPS

map title	scale 1:5000
GEOLOGICAL MAP (EASTERN PORTION)	date SEPT. 1985
	geology by B. KITE
	map no.

210