

GEOLOGICAL SURVEY REPORT

covering a portion of the

MULDREW LAKE CLAIM GROUP, Dublin Twp.

Porcupine Mining Division

held by S.L. Masson

Claims 839581 to 839584 inclusive

1 Map

Report by S.L. Masson M.Sc., F.G.A.C. Dated June 25th, 1986

Quarties file

RECEIVED

JUL 0 7 1986

MINING LANDS SECTION

CERTIFICATE

I, Stephen L. Masson, do certify that

- 1) I am a geologist with address R.R.#4, Powassan, Ontario.
- 2) I graduated from Haileybury School of Mines in Mining Technology in 1970.

I graduated from Laurentian University in Sudbury with an Honours B.Sc. in 1977 and a M.Sc. in 1982 and have been actively involved in geology since 1968.

- 30 I am a Fellow of the Geological Association of Canada
 - Member of the Canadian Institute of Mining & Metallurgy
 - Associate Member of the Society of Economic Geologists
- 4) The contents of this report are true and accurate to the best of my knowledge and are based on:
 - a) numerous visits to the property in 1985 and 1986
 - b) selected reports and maps listed on page 10.

Dated in Powassan, this 25th day of June 1986

S.L. Masson M.Sc., F.G.A.C. Contract Geologist



Ø10C

SUBJECT INDEX

Certificate	• • • • • •	1.
Summary	• • • • • • •	ı
Mining Claims Holdings		2
Location and Access		2
Grid		2
Survey Method		2
History and Previous Exploration	• • • • • •	5
Topography and Vegetation	• • • • • •	5
General Geology		6
Property Geology	• • • • • •	6
Shear Zones and Faults		7
Felsic Granitic Rocks		7
Metavolcanic Rocks		8
Economic Mineralization		9
Recommendation		9
Survey Personnel		9
Selected References and Maps	• • • • • •	10
Figures		
Figure 1 - Location Map	• • • • • •	3
Figure 2 - Claim Group Map		4
Maps		
Map 1 - Geological Map	ENCLOSE:	D

SUMMARY

A detailed geological mapping survey was completed over a portion of the Muldrew Lake Claim Group in Dublin Township.

Pb Zn Cu Ag mineralization was found to lie within a pyrrhotite pyrite rich quartz muscovite schistose felsic unit occurring in a narrow belt of largerly tuffaceous mafic volcanic rocks flanked by gneissic granodiorite.

The sulphide mineralization, although likely overprinted by axial plane shearing and strike faults appears strataform suggesting the potential for an exhalitive type massive sulphide deposit to occur along the horizon.

Au values obtained to date from a very limited portion of the mineralized horizon were not encouraging, however the resemblence of the mineralization to the host rocks of the Hemlo deposits and to the ores of the Doyon Mine in Quebec suggest that the ground should also be further assessed for Au as well as its base metal potential.

A soil geochem survey and a lithogeochem survey would greatly aid in narrowing the target areas for further work.

HOLDINGS

Four contiguous claims numbered 839581 to 839584 inclusive were staked June 15th, 1985 by S.L. Masson of R.R.#4 Powassan, Ontario. These claims now form a portion of a larger group referred to in this report as the Muldrew Lake Group, Dublin Project. This report does not cover the remaining portion of the claim group.

LOCATION AND ACCESS

The Muldrew Lake Claim Group are located at the north end of the Muldrew Lake in Dublin Twp. 65 miles (104 km) north of Sudbury and 35 miles (56 km) south of Gogama Ontario along Hwy 144. Access is readily available via Hwy 144 which passes through the centre of the property.

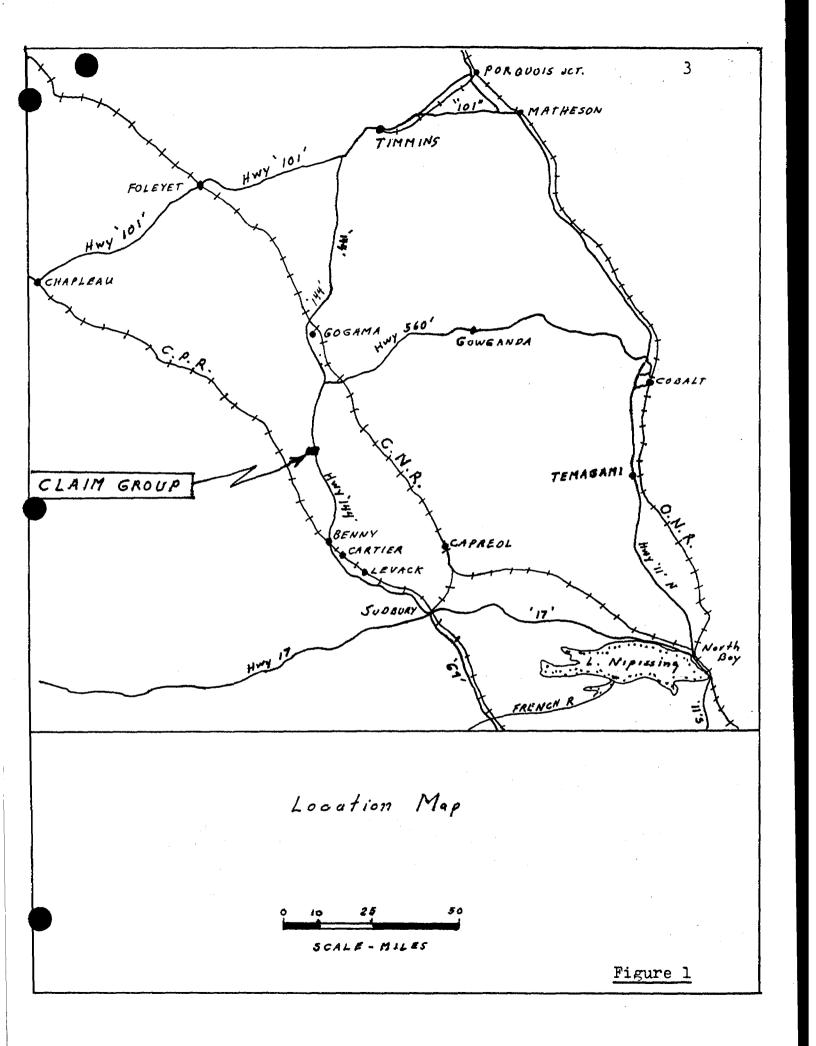
Location figures 1 and 2 show the exact location of the property.

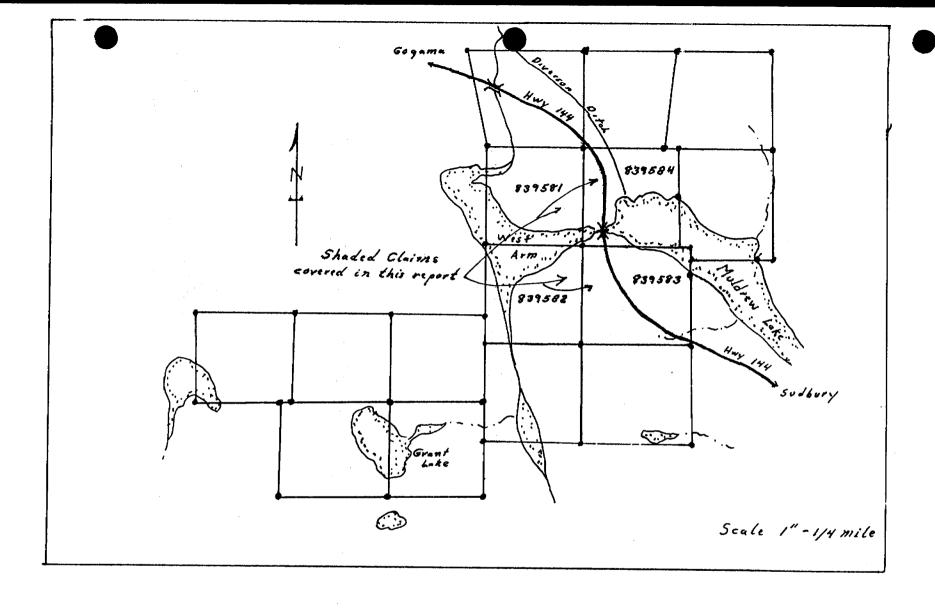
GRID

A small 200' line interval grid was flagged out by the pace and compass method over the main area of mineralization. This grid is plotted on Map 1 (back folder). Line 0 was extended further south than other lines to tie in the well exposed outcrops in roadcuts along Hwy 144. A total of 7640' of cross lines and 1800' of base line was flagged and marked at 50-food intervals. This grid does not correspond to grids previously established on the property by companies who formly worked the area.

SURVEY METHOD

The geology was mapped by the pace and compass method from control points established along grid lines, claim lines, creeks, lakes and Hwy 144. An air photo was used to accurately draw the shape and relative distances of creeks, Muldrew Lake and Hwy 144, and to accurately position some control points. The geology was mapped at a Scale of 1 inch to 200 feet and shown on Map No.1 in the back pocket of this report.





Claim Map - Muldrew Lake Group

Figure 2

HISTORY AND PREVIOUS EXPLORATION

A detailed history of the area up to 1970 has been described in a report by A.S. Bayne dated February 7th, 1972. Up to 1970 there is no recorded or field evidence of any exploration on the property until Bert Jerome's discovery of a Cu Pb Zn and Fe zone in a rockcut along Hwy 144 in 1970. No published detailed government geology maps cover the area.

In 1972 Jerome Exploration Limited carried out 28 line miles of linecutting and 20 line miles of VLF - EM and magnetic surveys. Channel sampling of the roadcut discovery outcrop and prospecting was was also carried out during this period.

In January 1979 Rio Tinto Canadian Explorations Limited through Aerodat completed an airborn magnetic survey over the property as part of an exploration endeaver that covered the entire known area of the Onaping Lake Volcanic Belt.

In 1980, Rio Tinto Canadian Explorations Limited as part of a larger drilling program completed one diamond drill hole (D.D.H.-O2) to test both the mineralization beneath Bert Jerome's discovery outcrop and a flanking VLF-EM conductor.

The writer in June 1985 staked the four claims covered by this report. In March 1986, eleven additional claims were staked forming the present Muldrew Lake Group of fifteen claims.

TOPOGRAPHY AND VEGETATION

The property is characterized by hilly terrain with maximum relief of 200 feet. Largely fault controlled lakes and revines separate the hills. twenty-five percent of the claims are covered by Muldrew Lake.

The northwest portion of the property north of Muldrew Lake is characterized by lower relief of 20-30 feet and contains pleistocene outwash deposits of sand, silty clay and gravels. Spillways during the last receeding glacial period followed the fault controlled depressions now occupied largely by Muldrew Lake.

The hills are mantled with thin to moderate thicknesses of sand covered largely by spruce, fir, poplar, and birch with minor maple. Sandy areas of low relief are characterized by jackpine with black spruce, tammerak and alders bordering water courses.

GENERAL GEOLOGY

The Ontario Geological Survey Map 2361 and the Ontario Dept. of Mines preliminary geological Map No. P300 show most of the surrounding area to be underalin by Arkean granitic and migmatitic rocks with two narrow E-W to ENE trending greenstone belts. The small greenstone belts are only shown on these maps in the Onaping Lake area 6 miles east of the property where they form isolated discontinuous blocks due to fair displacements along faults of the north trending Onaping System. Some displacement is also due to a NW trending fault set. The detailed airborn magnetic survey in 1980 by Rio Tinto Canadian Exploration Ltd. in this area indicated the belt extended, in a disruptive manner due to the faulting, westward through the Muldrew Claim Group, extending at least as far as the eastern portion of Battersby Township.

The Muldrew Lake Claim Group occurs in the northern and thicker of the two narrow greenstone belts. This is the same belt which hosts the Pb Zn Ag mineralization of the Zinc Lake Deposit in Shelly and Marshey Twps. 12 miles to the ENE.

Generally the metamorphic grade for the belt is biotite to amphibolite.

The Archean granitic and Volcanic rocks are cut by Proterzoic gabbro dyke sets trending N, NW and NNW.

PROPERTY GEOLOGY

The rocks underlying the four claims covered in this survey are all Precambrian in age. A small 1600-foot wide belt of mafic and felsic metavolcanic rocks traverses in a ENE direction through the centre of the claims. The volcanic belt is flanked to the NW and to the SE by granodioritic to trondjhmetic gneiss. The Archean granodiorite gneiss and volcanic rocks are cut by Late Archean Qtz Monsonite dykes and stocks. Numerous late NNW and NW trending Proterozoic gabbro dykes cut all of the above rocks. Metamorphic grade as indicated from mineral assemblages in the mafic volcanic rocks is biotite-amphibolite. Although garnet was observed locally, the writer is hesitant to assume the grade is Almandine-amphibolite as he has seen garnets in volcanic rocks of biotite grade.especially where garnets occur along particular stratographic horizons as is the case on this property. The volcanic rocks, the flanking granodiorite gneiss, and foliations within the quartz monzonitic rocks all dip south at 55 to 65°.

Shear Zones and Faults

Two ages of shearing and Faulting occur on the property: early premetamorphic shear zones and late cross faulting.

Premetamorphic shearing within the volcanic package is parallel to subparallel to stratigraphy and is most pronounced in the felsic tuffs where the shears are mineralized with pyrrhotite and pyrite and locally base metals. A premetamorphic age for the shearing is indicated by the quartz muscovite mineral assemblage of the schists.

Map No.1 accompanying the report shows two pronounced faults; one trending N 10° E through the West Arm of Muldrew Lake and a NW trending fault up Muldrew Lake. R.H. Henning reports from preliminary geological mapping by Jerome Explorations Ltd. that the NN Muldrew Lake fault has displaced the volcanic belt by several hundred feet.

Felsic Granitic Rocks

Two major granitic rock types occur on the property: gray gneissic granodiorite or trondjhmite and pink biotite quartz monzonite.

The granodiorite gneiss flanks the volcanic belt to the NW and to the SE. The granodiorite is gray on a fresh surface, porphyritic to subporphyritic and contains both biotite and hornblende. Generally the intensity of the finely layered eneiss decreases away from the contacts with the volcanics becoming weakly gneissic to well foliated. The south contact of the volcanic belt which is well exposed in a rockcut along Hwy 144 is well defined, however within the granodiorite gneiss for some distance occur elongated stretched exenoliths of the mafic volcanic rocks. Within the mafic volcanic package along this same contact is a 100-foot wide border zone containing numerous granodiorite sills and dykes. Here the gneissic layering in the granodiorite is conformable with the gneissic layering in the metabasaltic tuffs which is parallel to subparallel with bedding. This type of contact zone is strongly suggestive of a deep to moderate depth diaperic intrusion. The northern granodiorite flank is similar but less well exposed. The contact here is very sharp and is defined by a 2-4 foot wide boundary fault. shear is mineralized with fine pyrite.

Pink foliated biotite quartz monzonite dykes and stocks cut both the volcanic package and the northern granodiorite. The foliation within the stocks conforms with the strike and dip of the gneissic layering in the granodiorite and bedding within the metavolcanics. Locally muscovite biotite pegmatites occur near the border phases of these bodies. Magnetite is a common accessory to the pegmatites as it is with these quartz rich granitic rocks. The quartz monzonites are also commonly characterized by hematite (or K alteration) along fractures, locally containing minor pyrrhotite.

Along the westside of the roadcut of Hwy 144 near 17 South on Line 0, a breccia zone within the mafic volcanic tuffs contains fragments of Quartz Monzonite as the main clast.

Metavolcanic Rocks

The Volcanic belt at Muldrew Lake can be divided into two major groups: mafic flows and tuffs; and felsic tuffs, cherts (now quartzites), and tuffaceous metasediments.

Mafic Metavolcanic Rocks

The mafic metavolcanic rocks can be divided into two major subgroups: Mafic tuffs and mafic flows. South of the narrows separating Muldrew Lake and its West Arm are mainly well layered basaltic tuffs and lapilli tuffs. Mineralogically they are biotite amphibolite plagioclase rocks locally with garnet horizons. Minor pyrrhotite rich felsic tuffs or tuffites occur just south of the narrows within mainly basaltic lapilli tuffs.

North of the felsic package and south of the northern granodiorite contact is a 100-125 foot wide unit of maily gneissic to schistose massive amphibolite containing minor thin, less than 3 feet wide, units of pyrrhotite epidotized felsic tuffs. In a couple of areas pillow configurations were suggested but could not be confirmed.

Felsic Metavolcanics

Felsic tuffs and tuffaceous metasediments outcrop north of the channel between Muldrew Lake and its West Arm in the northern half of the the volcanic belt. They are sandwiched between mafic lapilli tuffs and tuffs to the south and mafic flows to the north. The unit outcrop width is 200 feet but could be as thick as 300 feet as suggested by a VLF conductor outlined in survey by Jerome Exploration Limited. Adjacent mafic volcanic packages contain minor thin sulphide bearing felsic units up to 3 feet in thickness.

The main felsic package can be separated into two major zones: northern finely layered poorly mineralized sericitic tuffaceous metasediment with minor cherts (Quartzites) and tuff layers; and a southern mineralized unit composed of up to 2-10% pyrrhotite and lesser pyrite with local concentrations of sphalerite, galena and chalcopyrite. The unit is well exposed in a roadcut along the west side of Hwy 144 in Claim 839584.

ECONOMIC MINERALIZATION

Potential economic mineralization appears to be confined to the sulphide rich silicified quartz muscovite felsic schist. This schist is strataform suggesting possibly the mineralization may be exhalitive in origin. Mineralization within the four claims can be traced to the west shore of the West Arm of Muldrew Lake. This gives the unit a strike length of approximately 1800 in these claims. The horizon in fact continues at least another 3 claims westward from reconnaissance observations on other claims in the group. Jerome Exploration Ltd. reported values up to 1.71% Cu, 2.20% Pb, 1.90% Zn and 0.81 oz per ton Ag. A.S. Bayne (1972) describes this mineralization in detail. A drill hole (D.D.H. -2) by Rio Tinto Canadian Exploration Ltd. was drilled northward under the main showing along Hwy 144. The hole intersected for the most part quartz muscovite and biotite schists. The best values obtained were 0.33% Zn and 0.11% Pb over 1.5 metres.

Thin mineralized felsic horizons within the mafic volcanic rocks and the shear zone along the northern contact of the volcanic belt were not assayed and may constitute targets for further work.

RECOMMENDATION

A soil geochem and lithgeochem survey would be a very efficient way of narrowing down target areas for further work.

SURVEY PERSONNEL

Stephen L. Masson	Powassan	May 31, June 1, 8, and 9, 1986
Richard H. Masson	Powassan	June 8 and 9, 1986

SELECTED REFERENCES

H. Beckmann

August 1979

for Rio Tinto Canadian Exploration Limited Onaping Lake Area (Mining Recorder File T-1927)

R.H. Henning

April 1973

for Jerome Explorations Limited
Progress Report on Dublin and Battersby Property
(Mining Recorder File T-2074)

J. Duncan Crone

September 1972

for Jerome Exploration Limited
Electromagnetic and Magnetic Survey over Dublin
and Battersby Townships
(Mining Recorder File T-2074)

A.S. Bayne

February 1972

for Jerome Exploration Limited Report on the Dublin Property (Mining Recorder File T-2074)

MAPS

M-767	Claim Map of Dublin Township Scale 1" to 1/2 mile
.M-2361	Ontario Geological Survey Sudbury-Cobalt Sheet Scale 1" to 4 miles
P-300	Ontario Department Mines Westree Sheet - Preliminary Map Scale 1" to 2 miles
41P/4	Department of Energy, Mines and Resources Topographical Map Low Water Lake Area Scale 1 to 50,000
279G and 280G	Geological Survey of Canada Aeromagnetic Maps

CERTIFICATE

I, Stephen L. Masson, do certify that

- 1) I am a geologist with address R.R.#4, Powassan, Ontario.
- 2) I graduated from Haileybury School of Mines in Mining Technology in 1970.

I graduated from Laurentian University in Sudbury with an Honours B.Sc. in 1977 and a M.Sc. in 1982 and have been actively involved in geology since 1968.

- 30 I am a Fellow of the Geological Association of Canada
 - Member of the Canadian Institute of Mining & Metallurgy
 - Associate Member of the Society of Economic Geologists
- 4) The contents of this report are true and accurate to the best of my knowledge and are based on:
 - a) numerous visits to the property in 1985 and 1986
 - b) selected reports and maps listed on page 10.

Dated in Powassan, this 25th day of June 1986

RECEIVED

JUL 2 1 1986

MINING LANDS SECTION

S.L. Masson M.Sc., F.G.A.C. Contract Geologist

At Minn

Claim Holder

Ministry of Northern Development and Mines

Report of Work

(Geophysical, Geological, Geochemical and Expenditu



ı fist. tered mns.

Type of Se

	#224/86
irvev(s)	

	4 4 9 9 1 06		2.3227 BOBLIN	900
Geolog	ical Su	rvey	Oublin To	up.
151			1 '	r's Licence No.
Tephen	L. Masso	? 1	C ,	34499
R#4	Powassan	, Ontario		
anγ	AND THE PARTY OF T		Date of Survey (from & to)	Total Miles of line Cut

Address Survey Comp Day Mo. Yr. Day Mo. Yr. Name and Address of Author (of Geo-Technical report) ght Mining Claims Traversed (List in numerical sequence) Stephen L. Masson Credits Requested per Each Claim in Columns at right Expend. Days Cr.

Special Provisions	Geophysical	Days per	N	lining Claim	Expend.	М	ining Claim
	Geophysical	Claim	Prefix	Number	Days Cr.	Prefix	Number
For first survey: Enter 40 days, (This	- Electromagnetic			839581			
includes line cutting)	- Magnetometer			839582			
For each additional survey:	- Radiometric			839583			
using the same grid: Enter 20 days (for each)	- Other			839584.			
	Geological	20					
	Geochemical					D.F.	A-F-1-1-2-1
Man Days	Geophysical	Days per Claim				KC	CEIVE
Complete reverse side and enter total(s) here	- Electromagnetic					7.30	L 28 1986
	- Magnetometer						
	- Radiometric					MINING	LANDS SEC
	- Other					1994	
	Geological			DECO	555		
	Geochemical			RECO	RDE)	
Airborne Credits		Days per Claim		The control of the co			To company of the Philadelphia Security (Security)
Note: Special provisions credits do not apply	Electromagnetic			JUL -	3 1986		Mayor o <u>analysis in an an ordered in announce</u> — MININ any mode in Nill Anno 1 proprie
to Airborne Surveys.	Magnetometer		1. 4				
<u> </u>	ad Mine Gic						
Expenditures excludes power	er stripping)						
	3 1986						
Performed on Claim(s)							
							. and and the state of the stat
Calculation of Expenditure Days	Credits						gygggggggggggggggggggggggggggggggggggg
Total Expenditures	7	Total s Credits					

NOIT

\		
Calculation of Expenditure Da	ays Credits	Total
Total Expenditures		Days Credits
\$	÷ 15	=

Total number of mining claims covered by this report of work.

Date /	Recorded Holder or Agent (Signature)
July 3, 1986	The Illian
Certification Verifying R	eport of Work

Total Days Credits may be apportioned at the claim holder's

choice. Enter number of days credits per claim selected

For Office Use Only	
Total Days Cr. Date Recorded Recorded	Manley
Days Approved as Recorded	British Officior

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 cor	npletion and the annexe	ed report is true.		
Name and Postal Address of Person Certifying Stephen .	172550n	RR#4	Powassan	Ontario
		Date C	ertified /86	Certified by (Signature)

in columns at right.

Mining Lands Section Control Sheet

MINING LANDS COMMENTS:

File No 2.9227

TYPE OF SURVEY

	GEOPHY	SIC?		
	GEOLOG	SICAL		
	GEOCHE	EMICAL		
	EXPEND	ITURE		
	•			
			-	
	-,			

Signature of Assessor

Date

August 13, 1986

Your File: 224/86 Our File: 2.9227

Mining Recorder
Ministry of Northern Development and Mines
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

RE: Geological Survey on Mining Claims P 839581 to 84 inclusive in Dublin Township

The Geological Survey as recorded on July 3, 1986 has been approved as of the above date. Please disregard the Notice of Intent dated August 1, 1986.

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

Yours sincerely,

J.C. Smith, Supervisor Mining Lands Section

Whitney Block, 6th Floor Queen's Park Toronto, Ontario M7A 1W3

Telephone: (416) 965-4888

DK/mc

cc: Stephen L. Masson R.R.#4 Powassan, Ontario POH 1ZO

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

Resident Geologist Timmins, Ontario



Ministry of Northern Development and Mines

August 1, 1986

Your File: 224/86

Our File: 2.9227

Mining Recorder Ministry of Northern Development and Mines 60 Wilson Avenue Timmins, Ontario P4N 2S7

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,

J.C. Smith, Supervisor Mining Lands Section

Whitney Block, 6th Floor Queen's Park Toronto, Ontario M7A 1W3

DK/mc Encl.

cc: Stephen L. Masson R.R.#4 Powassan, Ontario POH 1ZO -5. Masson called Aug. 8/86. Claims in jespardy as on July 15 and no other work filed o 17 days is close to 20, so let him have full credit.

Dais K.

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



Ministry of Northern Development and Mines

> Notice of Intent for Technical Reports

August 1, 1986 2.9227/224/86

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 the 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 directly 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.



Technical Assessment Work Credits

Dete | Mining Recorder's Report of Work No. | 224/86

Recorded Holder			
STEPHEN L. M.	ASSON		
DUBLIN TOWNS	нтр		
Type of survey and number of			
Assessment days credit per claim Geophysical	Mining Claims Assessed		
Electromagnetic days			
Magnetometer days			
Radiometric days			
Induced polarization days			
Other days			
Section 77 (19) See "Mining Claims Assessed" column			
Geologicaldays	P 839581 to 84 inclusive		
Geochemical days			
Man days Airborne			
Special provision X GroundX			
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 m	nining claims		
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; Geologocal - 40; Geochemical - 40; Section 77(19) - 60.

July 10, 1986

F11e: 2.9227

Mining Recorder
Ministry of Northern Development and Mines
60 Wilson Avenue
Timmins, Ontario
P4N 2S7

Dear Sir:

We received reports and maps on July 7, 1986 for a Geological Survey submitted under Special Provisions (credit for Performance and Coverage) on Mining Claims P 839581, et al. in Dublin Township.

This material will be examined and assessed and a statement of assessment work credits will be issued.

We do not have a copy of the report of work which is normally filed with your office prior to the submission of this technical data. Please forward a copy as soon as possible.

Yours sincerely.

J.C. Smith, Supervisor Mining Lands Section

Whitney Block, 6th Floor Queen's Park Toronto, Ontario M7A 1W3

Telephone: (416) 965-4888

AB/mc

cc: Stephen L. Masson

R.R.#4

Powassan, Ontario

POH 1ZO

