

Bowman

010

GEOLOGICAL REPORT on the properties of <u>CROSS LAKE MINERALS LTD.</u> Currie, Bowman and Hislop Townships District of Cochrane Larder Lake Mining Division by Robert. K. Abernethy, P.Eng. November, 1988

Jual 2.9965

RECEIVED

,

DEC 9 1988

MINING LANDS SECTION

ROBERT S. MIDDLETON EXPLORATION SERVICES INC. 136 Cedar Street South TIMMINS, Ontario P4N 7W8 (705) 264-4246 M-288



#### **Ø10C**

#### TABLE OF CONTENTS

PA	GE
	~

r tam ta a a la

.

SUMMARY	i
INTRODUCTION	1
PROPERTY, LOCATION AND ACCESS	2
PREVIOUS WORK AND EXPLORATION HISTORY	5
REGIONAL GEOLOGY	7
PROPERTY GEOLOGY	8
STRUCTURE AND STRATIGRAPHY 1	1
ALTERATION AND MINERALIZATION 1	2
CONCLUSIONS AND RECOMMENDATIONS 1	2
<b>REFERENCES</b> 1	4
CERTIFICATION	

,

#### LIST OF FIGURES

Figure	1	Property Location Map
Figure	Z	Ulaim Location Map
Figure	3	Previous Work Compilation Map
Figure	4	Geology Map - Group 1
Figure	5	Geology Map - Group 1
Figure	6	Geology Map - Group 1
Figure	7	Geology Map - Group 1
Figure	8	Geology Map - Group 1
Figure	9	Geology Map - Group 2 & 3
Figure	10	Geology Map - Group 4
Figure	11	Geology Map - Group 5
Figure	12	Geology Map – Group 6
Figure	13	Geology Map - Group 7
Figure	14	Geology Map - Group 8

#### <u>SUMMARY</u>

The Cross Lake Minerals Ltd. properties contain several targets considered on the basis of geological, geochemical and geophysical evidence to represent massive sulphide environments similar to those of the Noranda, Timmins and Matagami Camps.

Outcrop comprises less than 1% of the land surface, however diverse lithologies were identified including gabbros, basalts, intermediate to felsic pyroclastic tuffs to agglomerates, feldspar porphyries and diabase.

Regional geochemical and magnetic surveys indicate the presence of 3 distinct volcanic groups in the Currie-Bowman area. The Cross Lake Minerals properties straddle the contact between an un-named calc-alkalic Group and the tholeiitic Kinojevis Group.

A program of line-cutting, magnetic and horizontal loop electromagnetic geophysical surveys with follow-up diamond drilling of select targets is recommended.

- i -

#### **INTRODUCTION**

Cross Lake Minerals Limited of 301-121 Richmond Street West, Toronto, hold ninety two (92) unpatented, 40 acre, mining claims in eight (8) non-contiguous groups in Currie, Bowman and Hislop Township, District of Cochrane, Larder Lake Mining Division (Figures 1 and 2). Robert S. Middleton Exploration Services Inc. of Timmins, Ontario were retained by the management of Cross Lake Minerals to perform a geological survey covering the ninety-two claims.

geological mapping and prospecting survey was conducted The author (Abernethy) and, intermittently, by geologist Tom by the and geological technician Dan Sullivan. Guoth The mapping program commenced September 12, 1988 and was completed November 4, 1988. The survey procedures were to traverse grid lines on those claims where a grid is established, and traverse pace and compass lines and claim lines where no grids are established. lines are cut at azimuth 0° with azimuth 90° base lines and Grid Line separation is 100m and station spacing is 25m. tie lines. grid and base lines were traversed and attempts were made to A11 locate all claim posts and previously located outcrop. Traverses "non-gridded" claims were greatly assisted by the almost on the presence of old grid lines. ubiquitous Traverses on the "non-gridded" claims were made north-south along the old grid lines or by pace and compass lines running north-south. Spacing





of traverses was approximately 130m and all claim lines were traversed.

The objectives of the survey were to locate and identify all outcrops on the properties, sample all outcrops for lithogeochemical identification and prospect for geological conditions prospective of base metal and gold mineralization.

#### PROPERTY, LOCATION AND ACCESS

The Cross Lake Minerals property consists of ninety-two (92) unpatented, 40 acre mining claims in the District of Cochrane, Larder Lake Mining Division, Ontario and consist of the following eight non-contiguous claim blocks.

CLAIM BLOCK

CLAIM NUMBER

EXPIRY DATE

.....

1	948722	October 10, 1988
1	948723	October 10, 1988
1	948724	October 10, 1988
1	948725	October 10, 1988
1	948859	October 10, 1988
1	948860	October 30, 1988
1	948861	October 30, 1988
1	948862	October 30, 1988
1	948863	October 30, 1988
1	948864	October 30, 1988
1	948865	October 30, 1988
1	948866	October 30, 1988
1	949443	October 30, 1988
1	949444	October 30, 1988
1	949445	October 30, 1988
1	949446	October 30, 1988
1	949447	October 30, 1988
1	949448	October 30, 1988
1	949449	October 30, 1988
1	949450	October 30, 1988
1	949451	October 30, 1988

CLAIM BLOCK

#### CLAIM NUMBER EXPIRY DATE

P + Sem (c. . . .

1	949452	October 30, 1988
1	949453	October 30, 1988
1	949454	October 30, 1988
1	949455	October 30, 1988
1	949456	October 30, 1988
1	949457	October 30, 1988
1	949458	October 30, 1988
1	949459	November 28, 1988
1	949460	November 28, 1988
1	949461	November 28, 1988
1	949462	November 28, 1988
1	949600	October 21, 1988
1	949601	October 21, 1988
1	949602	October 21, 1988
1	949603	October 21, 1988
1	988412	December 31, 1988
1	988413	December 31, 1988
1	988414	December 31, 1988
1	988415	December 31, 1988
1	988416	December 31, 1988
1	988417	December 31, 1988
1	988418	December 31, 1988
1	988419	December 31, 1988
1	988420	January 7, 1989
1	988421	January 7, 1989
1	988428	January 7, 1989
1	988429	January 7, 1989
1	988431	January 7, 1989
1	988432	January 7, 1989
1	988433	January 7, 1989
1	988434	January 7, 1989
1	1001815	January 7, 1989
1	1001816	January 7, 1989
1	1001817	January 7, 1989
1	1001818	January 7, 1989
1	1001819	January 7, 1989
1	1001820	January 7, 1989
1	1030657	February 1, 1989
1	1030658	February 1, 1989
1	1030659	February 1, 1989
1	1030660	February 1, 1989
$\overline{2}$	988408	December 31, 1988
- 3	988409	December 31, 1988
4	1030853	February 1. 1988
4	1030854	February 1, 1988
-		

,

CLAIM BLOCK	CLAIM NUMBER	EXPIRY DATE
4	1030855	February 1, 1988
4	1030856	February 1, 1988
5	937761	February 1, 1989
5	937762	February 1, 1989
5	937763	February 1, 1989
5	937764	February 1, 1989
6	996898	August 19, 1989
6	996899	August 19, 1989
7	915429	May 5, 1989
7	915430	May 5, 1989
7	915431	May 5, 1989
7	915432	May 5, 1989
7	915433	May 5, 1989
7	915434	May 5, 1989
7	915435	May 5, 1989
7	<b>915436</b>	May 5, 1989
8	1033430	May 13, 1989
8	1033431	May 13, 1989
8	1033432	May 13, 1989
8	1033481	May 13, 1989
8	1033482	May 13, 1989
8	1033483	May 13, 1989
8	1033484	May 13, 1989
8	1036181	May 13, 1989
8	1036182	May 13, 1989
8	1036183	May 13, 1989
8	1036184	May 13, 1989

TOTAL

92 Claims

The properties are located in concessions II, III, IV and V, lots 1 through 12 inclusive in Bowman Township and concession IV, lots 1 and 2 in Currie Township and concession V, lots 10 and 11 of Hislop Township (Figure 2). Access to the property is excellent as much of the property is covered by past or present agriculture land and can be easily reached by automobile and all terrain vehicles via township roads which access Highway 11.

- 4 -

#### PREVIOUS WORK AND EXPLORATION HISTORY

Owing to the strategic location (centred between theprolific Porcupine and Kirkland Lake mining camps) and easy access, all outcrops in the map area have been extensively prospected and evidence of previous work such as blasted pits can be found at most outcrops. Prospecting previous to the early 1970's had centred on gold with the reported occurrence of several gold showings immediately adjacent to the Cross Lake With the Tillex syndicates' Cu-Zn-Pb-Ag-Au discovery property. on the Currie-Bowman Township property in 1974, the area was also as a potential base metal environment. recognized Due toextensive sand, clay and till cover in the area (less than 1% bedrock exposure) most of the recent prospecting has been restricted to deep sensing geophysical techniques and overburden geochemical techniques in addition to several diamond drill programs on, and adjacent to the properties. Below is a list of previous workers on and adjacent to the properties as researched the assessment files of the Ministry of Mines and Northern in Development offices in Kirkland Lake. Work performed on patented mining lands may not be filed at Kirkland Lake and is unknown to the author.

- 5 -

	<u>Year</u>	<u>Company</u>	Type of Work
1.	1974,75	<i>Tillex Syndicate</i>	ground magnetic ground electromagnetic 22 OVDH - 3725' 31 DDH - 13085'
2.	1980-84	Asarco	Ground magnetic survey Ground electromagnetic survey 10 OVDH - 1422' 5 DDH - 2011'
3.	1982-85	Kidd Creek	Airborne magnetic survey Airborne electromagnetic survey 12 OVDH
4.	<b>1987</b> .	Cross Lake Minerals	Ground magnetic survey
	<u>Bowman Town</u>	<u>ship</u>	
	<u>Year</u>	<u>Company</u>	<u>Type of Work</u>
1.	?	Bird, S.J.	1 DDH - 122'
2.	1967	Selco	1 DDH - 578'
3.	1971	Young/Davidson- Foster option	5 DDH - 1360'
4.	1974,75	Tillex Syndicate	Geology Ground magnetic survey Ground electromagnetic survey 2 OVDH - 86' 3 DDH - 945'
5.	1981-84	Asarco	Geology Ground magnetic survey Ground electromagnetic survey 28 OVDH - 2668' 5 DDH - 2356'

	Bowman Town	<u>isnip</u>	
	Year	<u>Company</u>	<u>Type of Work</u>
6.	1982-85	Kidd Creek	Airborne magnetic survey Airborne electromagnetic survey 24 OVDH
7.	?	Noranda	Ground magnetic survey Ground electromagnetic survey
8.	1988	Cross Lake Minerals	Ground magnetic survey

A compilation map of all previous work is shown in Figure 3.

#### REGIONAL GEOLOGY

Cross Lake Minerals Ltd. properties The lie within the Archean Abitibi Volcano-sedimentary greenstone belt of Northeastern Ontario. The Currie-Bowman area is dominated by east-west trending steeply dipping volcanic rocks and tuffs with minor interflow sedimentary rock. Regional metamorphic grade ranges from lower to upper greenschist facies.

A regional lithogeochemical survey has identified three distinct volcanic groups in the Currie-Bowman Area consisting of the komatiitic Stoughton-Roguemaure Group (possibly Lower Tisdale Group) in the northern half of the area, the tholeiitic Kinojevis Group in the lower half of the area, and the central un-named calc-alkaline Group. The Cross Lake Minerals properties straddle the boundary between the tholeiitic Kinojevis Group and the un-named calc-alkaline Group.

Regional economically important deposits which lie at or near the same stratigraphy as the Cross Lake property are the Tillex Cu-Zn-Pb-Ag-Au deposit in Currie Township, the Unigold (ex Seaway Copper Mines) Zn-Pb-Au deposit in Bond Township, the Ross Au Mine in Hislop Township and possibly the Cu-Ni and Cu-Zn-Pb deposit of Langmuir and Carmen Townships.

#### PROPERTY GEOLOGY

The Cross Lake Minerals properties are extensively covered by overburden and swamp deposits with only 1% outcrop. Outcrops consist of mafic intrusive and extrusive rocks, intermediate to felsic intrusive to pyroclastic rocks and diabase.

Mafic intrusive rocks were found in two locations. An outcrop in the southwest corner of claim number 949456 of claim group 1, consisted of a dark-green, medium to coarse-grained, massive gabbro. The outcrop was non-descript showing no obvious foliation, weak jointing at erratic angles and no quartz veining or significant alteration. A second similar appearing outcrop of gabbro occured in northwest quadrant of claim number 1030656 of claim group 4. The gabbroic rocks may represent coarser-grained phases of thick mafic flow rocks or may represent separate distinct subvolcanic feeder chambers of the chemically equivalent massive flows of the tholeiitic Kinojevis Group.

Komatiitic totholeiitic basalts are the most common lithology found on the southern claims of the properties. The variably jet basalts are black to grey to pale green. massive moderately foliated, magnetic fine-grained, totovariably carbonatized, silicified non-magnetic and and Pillow basalts and flow breccias were found only in chloritized. rocks of claim group 2 and 7. The variable appearance and chemistry (komatiitic to calc-alkaline) of basalts in concessions and IV of Bowman and Currie Townships suggest the existence IIIof interdigitated transition from the un-named an zone calc-alkaline Group to the north and the tholeiitic Kinojevis Group to the south.

Intermediate to felsic pyroclastic rocks were found on the flanks of a resistive diabase dyke in lots 7 and 8 of concession V in Bowman Township. The pyroclastic rocks range from very coarse-grained volcanic breccia/agglomerate to fine-grained ash tuffs and crystal tuffs. In the southwest corner of claim 948865 is a low density, very coarse-grained agglomerate containing sub-angular porphyritic, monolithic autobrecciated clasts in a siliceous, feldspar crystalline matrix. The agglomerate is bleached white on weathered surface and pale chloritic green on fresh surface with minor quartz vein stringers and traces to 1% pyrite and chalcopyrite. A large outcrop near the northern boundary of claim 948865 consists of a black, fine-grained, well

- 9 -

banded cherty/siliceous ash tuff. The essential pyroclasts are fine-grained (.5-2 mm) lithic fragments, feldspar crystals and, rarely, quartz shards, in an aphanitic siliceous matrix. The rock is thinly (1-5 cm) bedded, trending east-west and dipping between 50° to 60° to the south.

Two similar appearing feldspar porphyry outcrops are on the north boundary of claim group 6 and near the western claim line of claim 948860 in claim group 1. The feldspar porphyry is buff white on weathered surface and porphyritic chloritic green on fresh surface, coarse-grained, massive, and intermediate in composition. The feldspar phenocrysts comprise 40-60% of the rock and are medium-grained (1-5 mm), zoned, euhedral plagioclase crystals in an aphanitic green chloritic matrix. The rock is variably carbonatized with very minor quartz vein stringers and traces of pyrite and, in the claim group 1 porphyry, traces of chalcopyrite.

A large resistive olivine diabase dyke outcrops in the southeast corner of claim group 2 and continues northeastward to the central part of claim group 1. The diabase is rusty tan on weathered surface and dark green/black on fresh surface, ophitic, medium-grained, massive and moderately magnetic.

- 10 -

#### STRUCTURE AND STRATIGRAPHY

The eight Cross Lake Minerals properties in Currie-Bowman and Hislop Townships lie at or near the interdigitated transition of a major, fundamental change in volcanism. Based on major zone oxide and immobile trace element geochemical evidence from more 30 than bedrock samples in Currie, Bowman and Hislop townships, airborne magnetic and electromagnetic surveys performed by the Ontario Geological Survey and all previous geological and geophysical work performed in these townships, the stratigraphy in theCurrie-Bowman area can be subdivided into three volcanic Groups. The Groups trend in an east-northeasterly direction and to face and dip to the south. North of claim group 1 and appear Destor-Porcupine fault are mostly komatiitic rocks of the to the Stoughton-Roquemaure Group. The claim group 1 property appears be mostly underlain by calc-alkaline rocks of an un-named toAn interdigited transition zone appears to lie just south Group. the group 1 claim block where the calc-alkaline rocks grade of lower formations of the tholeiitic Kinojevis Group. into the Below the transition zone, individual flows of the Kinojevis Group have vey distinct magnetic signatures which are easily identified on the regional magnetic map.

#### ALTERATION AND MINERALIZATION

Rocks on the Cross Lake Property are variably altered including weak to moderate carbonatization, weak silicification and chloritization. The intermediate to felsic pyroclastic rocks the central portion of claim group 1 show in the strongest alteration being moderately carbonatized (calcite), strongly chloritized and weakly silicified. Up to 1% pyrite and chalcopyrite mineralization also occured in the pyroclastic rocks disseminated crystals and rare splashes of chalcopyrite. as The mafic volcanic rocks of the Kinojevis Group generally showed very alteration and little to no mineralization. Several pits weak were found exposing narrow barren quartz veins in the basalts of claim group 7, but the veins were narrow and unimpressive

#### CONCLUSIONS AND RECOMMENDATIONS

The preliminary evidence based on this geological survey, regional geochemical survey and the regional geophysical surveys suggests that many of the exploration criteria for massive sulphide deposition are satisfied on the Currie-Bowman property. These criteria are:

1. A calc-alkaline arc environment with at least two volcanic centres as evidenced by felsic intrusive rock and coarse-grained felsic pyroclastic rock (millrock).

- 2. Two known base metal deposits along a horizon that can be traced onto the Cross Lake Property and numerous chalcopyrite occurrences within the Cross Lake claim boundary.
- 3. The presence of several untested EM (INPUT) anomalies on the Cross Lake Property.

A program of line cutting, detailed magnetic and deep electromagnetic surveying is recommended covering the transition zone between the calc-alkaline Group and the tholeiitic Group and where known INPUT anomalies exist. Prospective anomalies should be diamond drilled as reverse circulation drilling would not prove useful in areas covered by Matheson esker complex.

Respectfully submitted

Rot Marnethy.

Robert K. Abernethy, P.Eng.

#### <u>REFERENCES</u>

Geological data p. geological survey a	resented in this report was obtained by the nd the following sources of information:
JENSEN, L.S. and BA 1986	KER, C.L. Preliminary Results of Bedrock Samples from the Sonic Drilling Program (1985) in the Lake Abitibi-Matheson Area, Cochrane District, Ontario Geological Survey, Map P2986, Geological Series - Preliminary Map, scale 1:100,000. Geology 1985.
LEAHY, E.S. 1965	<u>Currie and Bowman Township</u> , Ontario Department of Mines, Geological Report No.40 with accompanying map.
OGS	
1984	Airborne Electromagnetic and Total Intensity Magnetic Survey, Matheson-Black River Area, Bowman Township and Currie Township, District of Cochrane by Questor Surveys Limited for the Ontario Geological Survey. Maps 80593 and 80594 Geophysical/Geochemical Series, scale 1:20,000.
1985	Bowman Township, District of Cochrane, Geological Data Inventory File 271.
1985	Currie Township, District of Cochrane, Geological Data Inventory File 270.

,

#### CERTIFICATION

I, Robert K. Abernethy, P.Eng., of Timmins, Ontario, certify that:
1. I am a graduate of the University of Toronto with a Bachelor of Applied Science degree in Geo-engineering obtained in 1985.
2. I have been practising my profession in Ontario and Quebec since 1985.
3. I have no direct interest in the properties, have been practice of the properties.

3. I have no direct interest in the properties, leases, or securities of Cross Lake Minerals Limited, nor do I expect to receive any.

4. The attached report is a product of:

a) Data listed in the references

- b) Assessment work files Ministry of Natural Resources, Timmins, Ontario
- c) Geological surveying of the property in September and October, 1988.

Dated this November 30, 1988 TIMMINS, Ontario

Kil Mernethry.

Robert K. Abernethy, P.Eng.

Ontario	Report of Wo (Geophysical, G Geochemical ad	ork Geologica nd Expend	W8	PA10SE9543 2.1	1916 OVRTIE			900
Sande We	anagen	ins	£ n	g	Bowmi-	g/v Do not use	shaded areas below	v.
Type of Survey(s)	Madia			<u></u>	Township	a C D		
Claim Holder(s)	Mapping	2		191	6	Prospecto	r's Licence No.	
Gross Lake	Minerals	Lfq.	• 👗		<u> </u>	T -	5039	
% P.O. BOX 1	637. Timr	nins_	Onter	io Pyn	-7N8			
B.S. Middleton	Evolocation	Sarry	Tno	Date of Survey	(from & to)		Total Miles of line	Cut
Name and Address of Author to	f Geo-Technical report)			Day Mo.	Yr.   Day   1	MO. Yr.	<u> </u>	
Credits Bequested per Each (	hy, P.O. DOX	1637 T	Immins Mining C	: Ontario	PUN 7W8	rical coolu		
Special Provisions	Geophysical	Days per	N N	lining Claim	Expend.	N Profile	lining Claim	Expend.
For first survey:	- Electromagnetic	Claim	Prefix	QISUDO	Cays Cr.	Pretix	QUDD	Days Cr.
Enter 40 days. (This includes line cutting)	- Magnetometer			CIEUZO			-178066 0.10111-	
For each additional events	- Radiometric		1. S.	915/121	+		<u>949443</u>	
using the same grid:	- Other			915431			949444	
Enter 20 days (for each)	Geological	20		915436			949495	
	Geochemical	20		715435			744446	
Man Days	Geophysical	Days per		915434			749447	
Complete reverse side		Claim		915435			949448	
and enter totalis) here				415436			949449	
	agnetometer			937761			949450	
				437762			94945	+
10.15cm	- Other	ļ{		937763			949452	
67	Geological		بېرىمىيە. ئىشتېپىر بىرىي	937764			949453	
Airborne Credits	Geochemicat	Davs per		948722			949454	
	<b>)</b>	Claim		448723			949455	
Note: Special provisions credits do not apply	Electromagnetic			948724	-		949456	-
to Airborne Surveys.	<b>ECEIVE</b>			948725			949457	
Europeines (augliering and	Radiometric			948859			949458	
Type of Work Performed	1988			948860			949459	
				948861			949460	
Performed on Claim(s) MIN	ING LANDS SEC	HUN		948862			949461	
				948863	-		949467	<u>ا</u>
Calculation of Expenditure Days	s Credits		i a tubi i tubi i tubi tu	948864		No.	949600	
Total Expanditures		s Credits		948865			949601	
\$	_ + 15 = _		PAG	e 1 of 2		Total nur claims co	nber of mining	27
Instructions Total Dave Credits may be	portioned at the date t	oider's				report of	work.	010
choice. Enter number of day in columns at right.	s credits per claim selecto	ed	Total Day	For Office Use ( s Cr. Date_Recorded	Only	Mining Re	corder	10
	······································		Recorded	n Ont.	27/98	M. l	a. alenne	~
Dete October 20/88	corded Holder or Agent (	Signature)	126	Date Approved	s as Récorded	Branch Di	ment.	
I hereby certify that I have a or witnessed same during and	personal and intimate ki l/or after its completion	nowledge of and the ann	the facts set	forth in the Report true.	of Work annex	ked hereto,	having performed t	he work
Name and Postal Address of Per	son Cersifying					_		
% P.O. Box 1637	Timmins O	ntario	PYN 71	V8 October	20/88.	Contied	by signature the Hols	nettaj
1362 (85/12)						v	•	, V

. . . . . .

í.

•

.

			Minin	g Act	-	in the "E Do not use	xpend. Days shaded areas be
Geological	Mapping				- Cunship	ie e B	Owman.
Claim Holder(s) 0 Cross Lake Hi	nerals itd.					Prospector	's Licence No.
				10			
Survey Company				Date of Survey Day   Mo.	Yr. Day	Mo, I Yr.	Total Miles of I
Name and Address of Author	of Geo-Technical report)						
redits Requested per Each	Claim in Columns at r	right	Mining C	laims Traversed (	List in nume	rical seque	nce)
Special Provisions	Geophysical	Days per Claim	Prefix	Aining Claim Number	Expend. Days Cr.	Mi Prefix	ning Claim Number
For first survey: Enter 40 days, (This	- Electromagnetic			949602			1001816
includes line cutting)	- Magnetometer			949612			1001217
For each additional survey	- Radiometric			90000	11		
using the same grid:	- Other			900100	<b>††</b>		
Enter 20 days (for each)	Geologicat			308409	<b></b>		1001818
	Coost			388412	╂┨	a a tradition La production de la companya de la c	1001820
Man Days	Geochemical	Dave car		988413	·}}		103065
Complete reverse -ide	Geophysical	Claim		988414	<u> </u> ]		1030658
end enter total(s) there -	- Electromagnetic			988415			1030659
Ir.	agnetometer			988416			103066
	adiometric			988417			103085
	Uther			9 paule	1		102/054
10.15 and	Geological		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	90010	11		100001
(A	Geoclemical		1	511000	+		103000
Airborne Creato		Days per		000 10	┨───┨		10 30%36
Alasa, Caralat and	-	Claim		288421			
redits do not apply	Electromagnetic	;		988428	-}		
to Airborne Surveys.	Magnetometer	; ;		988429			
	Radiometric			988431			
xpenditures (excludes por	wer stripping)			988432			<u>.</u>
.,			· .	988433			
Performed on Claim(s)	·····			988424			
				9962000	<u>†</u>		
			100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	001000	<u>+</u>		· · · · · · · · · · · · · · · · · · ·
Calculation of Expenditure Da	ys Credits	Total	and the second sec	1001015		A CAR	
Total Expenditures		rs Credits	L	F. 2. OF 2	J	L	
<b>\</b>	+ [15] = [		(110			Total num claims cov	ber of mining ered by this
nstructions Total Days Credits may be	apportioned at the claim I	holder's	ſ	For Office Has f			
choice. Enter number of da in columns at right.	ys credits per claim select	ed	Total Day Becorder	s Cr. Date Recorded		Mining Rec	corder
	erorded Holder or Asser /	Signatura		Date Approver	as Becorded	Branch Dir	ector
Pate A	erorgen Horger of Agent (	ວາມູກສະບານ)					
Certification Verifying Rep	ort of Work		·····				·····
I hereby certify that I have or witnessed same during a	a personal and intimate k	nowledge of and the anne	the facts set exed report i	forth in the Report s true.	of Work annex	ked hereto, h	aving perform
Name and Postal Address of Pe	arson Certifying						
						Considered	u /Cinnatural
				Late Certified		Leaunieg D	v (orgine (ure)

•

M-288 DOCUMENT No. instructions: -- Please type or print. Ministry of **Report of Work** If number of mining claims traversed Northern Development (Geophysical, Geological W8808 · 44/ exceeds space on this form, attach a list. and Mines Note: - Only days credits calculated in the "Expenditures" section may be entered in the "Expend. Days Cr." columns. Geochemical and Expenditures Ontario **Mining Act** Do not use shaded areas below. BOWMAN Type of Survey(s) 2 6 1988 Mapping Geologica Prospector's Licence No. Claim Holder(s) Cross calle Minerals Ltd. 5039 Address P.O. Box 1637 Timmins Ontario P4N 7W8 Date of Survey (from & to) Total Miles of line Cut Survey Company, R.S. Middleton Exploration Services Day Mo. 1 Yr. Day Mo. 1 Yr. Name and Address of Author (of Geo-Technical report) L. Abernethy P.O. Box 1637 Timmins Ontario PUN7W8 Credits Requested per Each Claim in Columns at right Mining Claims Traversed (List in numerical sequence) Mining Claim Mining Claim Expend. Days Cr. Expend. **Special Provisions** Days per Claim Geophysical Davs Cr. Prefix Number Number Prafix For first survey: 9 Electromagnetic 48722 Enter 40 days. (This includes line cutting) - Magnetometer Min. Radiometric For each additional survey: using the same grid: - Other 779 Enter 20 days (for each) ALL. Geological 20 1 -0-1.9 152 ▼/€ Geochemical Man Days Days per Claim ۳. ) Geophysical 1 Complete revolution Non-ISIN ..... 1.12 Electromagnetic Magnetometer 1.4 Î ladiometric 11 1988 ور بۇر. رىيىدۇ Ÿ. . d the 0.10 am a. 1 Geolog ų, Geochemical Airborne Credits Days per Claim Electromagnetic Note: Special provisions credits do not apply Magnetometer to Airborne Surveys. U. Radiometric Expenditures (excludes power stripping) Type of Work Performed Performed on Claim(s) Calculation of Expenditure Days Credits Total Days Credits Total Expenditures Total number of mining \$ + 15 = Ч claims covered by this report of work. Instructions Total Days Credits may be apportioned at the claim holder's For Office Use Only choice. Enter number of days credits per claim selected Date Recorded Total Davs Cr in columns at right. Recorded wher 80 oved as Recorded Date App Branch Date Recorded Holder or Agent (Signature) x.P. 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. P.D. Box 1637 Timmins Ontario PHNI 7W8. Name and Postal Address of Person Certifying inthia Abernethij Centeral by Gignatury Dete Certified 88 Ctoker 1362 (85/12)

NOU DOCUMENT No. Report of Work Instructions: Please type or print. 30 Ministry of If number of mining claims traversed exceeds space on this form, attach a list. Northern Development (Geophysical, Geological W8808. 44/ and Mines Only days credits calculated in the "Expenditures" section may be entered in the "Expend, Days Cr." columns. Geochemical and Expenditures Note: itario Mining Act Do not use shaded areas below. ib or Area 0 Geologi Cal iman Prospector's Licence No ross Lake Minerals Ltd 5039 Address P.O. Box 1637 Timmins Ontario PYN Date of Survey (from & to) Total Miles of line Cut Survey Company R.S. Middleton Exploration Services Day Mo. 1 Yr. Day Mo. 1 Yr. Reme and Address of Author (of Geo-Technical report) R.K. Abernethy P.O. Box 1637 Timmins PUN7W8 Ontario Credits Requested per Each Claim in Columns at right Mining Claims Traversed (List in numerical sequence) **Special Provisions** Expend. Days Cr. Days per Claim Mining Claim Expend. Days Cr. Mining Claim Geophysical Prefix Profix Number Number For first survey: 948722 - Electromagnetic Enter 40 days, (This includes line cutting) Magnetometer 948 723 - Radiometric 948724 For each additional survey: using the same grid: Other 948 775 Enter 20 days (for each) Geological 20 5.41 Geochemical Man Days Days per Claim ÷ Geophysical Complete reversion Activision ENVIE Electromagnetic ..... ..... lagnetometer in adiometric OCT 11 1988 RECEIVED 0.10am - Other Geolog 1 1988 Geochemical Airborne Credits Days per Claim MINING LANDS SECTION Note: Special provisions Electromagnetic ONTANIO GEOLOGICAL SURVEY credits do not apply Magnetometer to Airborne Surveys. ASSESSMENT FILES OFFICE **Badiometric** Expenditures (excludes power stripping) JAN 1509 Type of Work Performed Performed on Claim(s) RECEIVE D Calculation of Expenditure Days Credits Total Days Credits Total Expenditures \$ Total number of mining claims covered by this report of work. 15 ÷ 4 Instructions Total Days Credits may be apportioned at the claim holder's For Office Use Only choice. Enter number of days credits per claim selected Total Days C in columns at right. Recorded 80 Recprided Holder or Agent (Signature) Dat x.P 1074 <u>1602</u>X 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 ynthia Abernethu F4N 7W8. P.D. Box 1637 Timmins Ontario ertified by (Signature Data Cectified 88 nittian 1362 (85/12)

	Ministry of	Damant of M		DOCLIMEN	IT NO.		Diagon du		
	Northern Developme	nt (Geophytical J	Geologica	MAROR	.491			r of mining claim	ms traversed
	Ontario	Geochemical a	nd Expend	itores)		-110-	niy day	vs credits calcula	sted in the
· · · · · · · · · · · ·				Mining	RFU	EIVE	in the "i	Expend, Days C	" columns,
	Type of Survey(s)		<u> </u>		- OT 2	7 1900 mehip	gr Arpe		<u>,,,,,</u>
	Geological	Mapping			001 -	' Curr	EEB	owman	
•	+ Cross Loke	Minerals	110					5030	
	Address CI. O. O.		- yre		~	····	4	0009	
	Survey Company	637, Timr	nins_	Onter	io P41	N-7WB		Total Miles of line	Cut
•	R.S. Middleton	Exploration	Serv.	Inc.	Day   Mo	Yr. Dav I	Mo.   Yr.		
	Name and Address of Author to	Geo-Technical report)	1423 -		O . ko . in	Q11.1 71.10	, ,	саяна, н. ,	
•	Credits Requested per Each (	Claim in Columns at r	iaht	Minina C	aims Traverse	d (List in nume	erical seque	encel	
	Special Provisions	Geophysical	Days per	M Brotin	lining Claim	Expend.	M	lining Claim	Expend.
	For first survey:	- Electromagnetic		FIGHT	QIEUDO		Pretix	QUIDO	Days Cr.
	Enter 40 days. (This includes line cutting)	- Magnetometer			MO424			778866	
•	For each additional array	- Radiometric		The Parts	915430			<u> 949 443</u>	
	using the same grid:	• Other			715431			949444	
	Enter 20 days (for each)	Geological			915437		1477 - 14 15 - 15 - 15 - 15 - 15 - 15 - 15 - 15 -	949445	
,			20	. Buch	415433		5.6.6.39 36 36	949446	
	Man Days	Geochemical	Dave par		915434		10 and 1 Au	949447	
	Complete rejerre side	Geophysical	Claim		915435	<u>i</u>		949448	
	and enter totalls) here	Electromagnetic			915436			949449	
		agnetometer			937761			949450	
		adiometric			937762		1.1	949451	
	OCT 24 399	- Other			937763			949452	
а. С	10.15am	Geological			93776	2		949452	
	Q7	Geochimicat			Quan	•		949464	
	Airborne Credits		Days per		Que 177			010 4=-	
	Note: Special provisions	Electromagnetic			0.0725	?		949455	
	credits do not apply	Magnetometer			-146+24	¥		343456	×
	to Andonie Surveys.	Padiometria			MH872	5		24945+	
	Expenditures (excludes powe	r stripping)	<b>/</b>	da sa pa	44885	9	1. N. 1. 1 10	949458	8-
	Type of Work Performed				948860	<b>&gt;</b>		949459	2
	Performed on Claim(s)				948861			949460	24
					948862	<b></b>		949461	
					948863	s_		94946	2
	Calculation of Expenditure Days	Credits		1 1 1 1 1 1 1 1 1 1 1 1	948864	L	2. 7.	949600	
. •	Total Expenditures	Day:	s Credits		94886	5		949601	
	\$	+ 15 =		PAGE	é 1 of 2		Total nur	mber of mining	21
	Instructions						report of	work.	00
	choice. Enter number of days	portioned at the claim h credits per claim select	older's	Total Day	For Office Us	se Only	Mining Re		18
	in columns at right.			Recorded		24/98		(1) on mil	.
	Date October 20180	orded Holder or Agent (	Signature)	1,56	Date Appro	ved as Recorded	Branch Di	irector	
	Certification Verifying Repo	t of Work	0		1			· · · · · · · · · · · · · · · · · · ·	
	I hereby certify that I have a or witnessed same during and	personal and intimate ki /or after its completion	nowledge of and the ann	the facts set f exed report is	orth in the Rep true.	ort of Work anne	xed hereto,	having performed	the work
	Name and Postal Address of Peri	ion Certifying							1
	8 P.O. Box 1637	Timmins O	ntario	PYN 71	V8 Date Certif	100 /08	Certified	by Signature	witter.
,	1362 (85/12)				10000	nov 100.	1 yr	mappe	



Ministry of Northern Development and Mines

Ministère du Développement du Nord et des Mines

January 3, 1989

Mining Lands Section 3rd floor, 880 Bay Street Toronto, Ontario M5S 1Z8

Telephone: (416) 965-4888

Your file: W8808-491 Our file: 2.11916

Mining Recorder Ministry of Northern Development and Mines 4 Government Road East Kirkland Lake, Ontario P2N 1A2

Dear Sir:

Re: Notice of Intent dated December 16, 1988 - Geological Survey submitted on Mining Claims L915429 et al in Currie & Bowman Townships

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,

W.R. Cowan Provincial Manager, Mining Lands Mines & Minerals Division

RM:p1 Enclosure

> cc: Mr. G.H. Ferguson Mining and Lands Commissioner Toronto, Ontario

> > Cross Lake Minerals Ltd. c/o P.O. Box 1637 Timmins, Ontario P4N 7W8

Resident Geologist Kirkland Lake, Ontario

R.S. Middleton Services Inc. P.O. Box 1637 Timmins, Ontario P4N 7W8



and

Ç

Ministry of Northern Development

nes

			Flie
			2.11916
Date			Mining Recorder's Report of
December	16,	1988	W8808-491

~

Cross Lake M	inerals Limited
Currie and Bo	owman Townships
Type of survey and number of Assessment days credit per claim	Mining Claims Assessed
Geophysical	
Electromagnetic days	
Magnetometer days	L 915429 to 436 inclusive 937761 to 764 inclusive
Radiometric days	948859 to 866 inclusive 949443 to 462 inclusive 040600 to 603 inclusive
Induced polarization days	988408-409
Other days	988412 to 421 inclusive 988428-429
Section 77 (19) See "Mining Claims Assessed" column	988431 to 434 inclusive 996898-899
Geological days	1001815 to 820 inclusive
Geochemical days	1030853 to 856 inclusive
Man days 🗌 🛛 Airborne 🗌	
Special provision 🔀 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 m	ining claims
No credits have been allowed for the following mining cl	aims
not sufficiently covered by the survey	] Insufficient technical data filed

Taylor Twp.

•	¢ Ø	Ð	®	(\$80014 (\$80014 (\$80015) (\$80015)	P	e	Baquat Samat	india 1 1 1 0 1 0	) <b>e.</b> P	P P	, <b>`</b> @	
х х	P	L B36827 B36826 763379 743879 L B40 B36828 B36837 763377 283376	L L +83300   836834 436835 0 763301 	© (	• •	0	R. C.	0	@	878737 878737 878737 831745 831745 8.R.O. 878735 878734	@	
	105641 405649	Ø	+ + + + + + + + + + + + + +	L (; 836830 783369 L L 836819 783388 783388 783388	L L B33257 B33263 283364 293267 L L B33134 B36679 783363 783366	Ø	P WITHDA	D. AWN FROM STAKING	Ø	10	1030236 18340 46 1930236 18340 46	
:	Ð	©   © :	L L 536824   836821 757624   763245 L   L 836823   836821 787625 - 783244	₩33361 55 RO 933192 7€ 46-16 5 RO 6234344	L 703302 0133135 042126 L P 1760046 758047 S 1750046 758047 0 834345 885780	D 4912299 8314000 4912299 8314000 Grassy	878150 75020 7500000000	SURFALE RIGHTS WITHDHAWN FROM SANLING 818727 818124 818728 818729	D 575720 5.R 277731	1030230 1030231 814314 834315 1030228 1030259 8344312 834915	1030235 1030233 1030235 1030233 1030236 1030234 1030236 1030234 034068-1884090	
p.	L U LE75492 597122	B 	1. 826536 735566 783243 1. 826535 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	258851 758850 EXPLORATORY UCENCE 19916 S.R.	L 758849 S.R.O 758848 S.R.O 769625 789625 789625 789625 789630 S.M. 644 0845 789630 S.M. 644 0845 758848 759655 789555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 7895555 78955555 78955555 78955555 789555555 78955555 78955555555 7895555555 789555555555 789555555555555555555555555555555555555	789 699 789680 L L 784682 789681	Application	© .	Ð	1030227 1030226 234320 1030226 1030224 1030225 0 1030225	. @	94 821
d Tw	B 60 494	e	no of the second	) @ 	7336260 S. F. D P P	L L 789683 789684 L L . 789686 789685	(P)	Ð	P	675074 ©	400 - 1449 00 10000 - 1449 00 100000 - 1449 00	- q. 2 
Bon	833408 834041 +365721737777	834552 834378 735574 735678 L L Y- 833390 788447 789625 709634	834586 831392 733576 789831 L L L 190446 835391 789622 789652	880537	SRO. (P) 6R0 78961: 789612 880538 880539 83653 63665 789614 709613	L L 789607 789688 L L 789690 789685 834337 814336	L L 87/603 97/604 700:47 700:48 L L 866721 866722 790249 100260 L	555139 555146 555130 555146 5149052 54905 549052 54905	555/41 655/42 555/41 655/42 549050 555/42 549050 1005147 1950902	• •		       
	P	SC7704 867707 789639 789648 L 867705 867706 789646 789645	169641 - 59647 867708 - 866776 	754618 3300455 100456 18805281 1880524 3805281 180528 18805281 180528 184624 175642 195615 10158 1015677	100533 880532 10066 970055 200610 280620 L 100530 50531 1005622 -789621 -709622 -789621	199691 194132 (P) 199692 030337	866724 866723 790453 790458 L L 866725 866726 790454 790255	453824 1035084 17103508 054456 17103508 10350845 RO 455824 953825 024450 26586	1035000 453807 1035000 453807 1035000 453807 1035000 453807 10539214	950903 950904 524440 027449 027449 024440 100000 000000 000000 000000 000000 000000	450925 628089 -	- 62 - 62
	799642 799649	<del>789650</del>	7 <del>81342</del>   <del>781343</del>	@ 	1036464   1036463 1036464   1036463	1036462   1036464 1036462   1036464 1036462   1036464 1036462   1036464 1036462   1036464 1036370   1035389	154420 454421 	1035064 1035065	1035064 1036549 1035067 1036550	©	<b>•</b>	- 0
	****** #06248 					15-14-34 45-14-25 700044 ,700041 -700044 ,700041 -75-545 1038372 1038575 103857	861001 1881-001 598486 598479 1035393 1035394 1035393 183594 1035394 1035594 1035594 1035594 1035594 1035594 1035594 1035594 1	661+511 681054 690495 690484 881052 80005 1035075 1025072	1035070 1036050 1036050	1036557 1036556	1036555 [ 1	MRO
						1035396 1035395	• • • • • • • • • • • • • • • • • • •	1035055	1036075 1036559 1038054 1 1036560 1034364 1034366			
				$\mathcal{O}^{-1}$					L	1034378   1034372	034177 W P L 5	
•	12	11	10	9.	8	7	6	5	. 4	3	2	
42A 10 SEB 543 2.11916 CURREN 200								.*				

J. v. Kalben









# 42A 105E8543 2.11916 Subart

.

.

![](_page_31_Figure_0.jpeg)

![](_page_31_Figure_1.jpeg)

## outcrop, small outcrop, float geologic contact, known geologic contact, assumed bedding, top known, overturned pillow basalt, top known lineation foliation, schistosity, with dip vein attitude, with width in cm. onticline, syncline, with plunge plunging drag fold glacial striae, esker diamond drill hole, overburden drill hole rood, trail power line, transmission line railway track trench, length, pit shaft, adit topographic slope moraine, boulders beaver dam, lake, creek swampy overburden claim post, located, assumed, witness · post sample location number claim number comp 2.11916 ROBERT S. MIDDLETON EXPLORATION SERVICES INC. CROSS LAKE MINERALS LTD. CURRIE-BOWMAN PROJECT GROUP I

Date: Nov. 1988 Scale: 1:2500 N.T.S.: Fig. 5 Drawn: R.A:/A.M. Approved: File: M288

![](_page_32_Figure_0.jpeg)

4

• • •

![](_page_32_Figure_1.jpeg)

![](_page_32_Figure_2.jpeg)

![](_page_32_Figure_3.jpeg)

![](_page_33_Figure_0.jpeg)

![](_page_33_Figure_1.jpeg)

.

•

![](_page_34_Figure_0.jpeg)

![](_page_35_Figure_0.jpeg)

![](_page_36_Picture_0.jpeg)

![](_page_37_Figure_0.jpeg)

.

• .

.

![](_page_37_Picture_1.jpeg)

LEGEND Road Road Trail T\_\_\_\_\_T\_\_\_\_Telephon Assumed Mown C

937763

Road Trail Telephone Line Assumed Claim Post Known Claim Post Claim Number.

2.11916

Ros Manething							
REVISIONS	ROBERT S. MIDDLETON EXPLORATION SERVICES INC.						
	CROSS LAKE MINERALS						
	Title CURRIE-BOWMAN PROJECT CLAIMS 937761-937764 INCL. GROUP 5						
	Date: Oct. 88	Scale: 1:2500	N.T.S.: Fig. II				
	Drawn: R.A./A.M.	Approved:	File: M288				

![](_page_38_Figure_0.jpeg)

![](_page_39_Figure_0.jpeg)

2

2+00

00+6

**8**+00

![](_page_39_Figure_15.jpeg)

• ,

N 00+0

æ

0

42A108E9543 2.11916 (CARTE A)

1

6+00

5+00

![](_page_40_Figure_0.jpeg)

### LEGEND

## \_\_\_\_\_ Trail \_\_\_\_ $< > \times$ and \_ \_ 1033431

## Claim post – known Topographic slope Outcrop, small outcrop Foliation, schistosity Lake and stream Claim number

# 2.11916

	R	Bernether	× .			
REVISIONS	ROE EXPLO	ROBERT S. MIDDLETON EXPLORATION SERVICES INC,				
	for CROSS L	AKE MINERALS	LTD.			
	Title	CURRIE-BOWMAN PROJECT				
		GROUP 8				
	Date: Nov. 1988	Scale: 1:2500	N.T.S.: Fig. 14			
······································	Drawn: R.A./A.M	Approved:	File: M288			

![](_page_41_Figure_0.jpeg)

42A10SE8543 2