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Basic Gypsum Resource Calculation and Geotechnical Report for Moose River Crossing Property

Carrol and Canfield Townships Porcupine Mining Division Ontario

2.10-200

Submitted To: James Bay Lowlands Development Group January 12, 1995

Kevin Cool





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Introduction

In 1994 two diamond drill holes were drilled on the Moose River Crossing Gypsum property. The conclusions of this work, based mainly on the thicknesses intercepted supported by geochemical analysis, were as follows:

"The Moose River Crossing property contains a substantial, near surface deposit of high purity gypsum".

These two holes however, are not the only evidence of this vast deposit.

In 1993, our development group utilized a CAT EL200 excavator to dig test pits on the Moose River property. Four test pits up to 220m apart and 850m inland from the river outcrops, exposed the massive high purity gypsum deposit.

In 1955, a geological survey, reported by R.E. Parkes in assessment file T-634, found white and brown gypsum up to 15 ft. thick and up to 1600 ft. inland from the Moose River outcrops.

In 1925 Geo. E. Cole quotes an earlier description by J. Mackintosh Bell as follows:

"There are two beds, the upper extending along one side of the river for 2 1/2 miles and along the other side for 2 3/4 miles."

These outcrops provide an excellent cross section of the gypsum where the Moose River has cut through the deposit. The 10 metre high outcrops of massive gypsum found here further demonstrate the thicknesses that are found 850m inland. These outcrops undoubtedly provide information naturally on a large scale that cannot be outdone by the most intensive drill program. The relatively low number of inland drill holes and test pit exposures are made more relevant thanks to the presence of these outcrops.

Armed with test pit, drill hole, and some topographic data, we felt that we were close to having an estimate of available gypsum resource. Obtaining more topographic information and tying existing pit, drill hole, and topographic data into a common survey, as well as tying the river outcrops into this system has enabled us to finally calculate basic gypsum resource quantities as well as approximate overburden quantities. The survey also met our desire to be sensitive to local concerns by carrying out assessment work with a minimum of additional disturbance to the area. This report outlines the above survey work and includes the basic gypsum resource estimate that the survey made possible.

Property

The Moose River Crossing Gypsum property consists of 11 contiguous claims containing 21 units, all within Carroll and Canfield Townships, Porcupine Mining Division. The property is owned wholly by the James Bay Lowlands Gypsum Development Group. The 11 claims are divided as follows;

P 1131388	l unit
P 1170589	l unit
P 1170590	l unit
P 1188875	l unit
P 1188877	l unit
P 1188876	2 units
P 1190293	l unit
P 1190294	l unit
P 1190295	4 units
P 1190296	2 units
P 1190297	6 units

Location and Access

The property is located in Carroll and Canfield Townships, Porcupine Mining Division, Cochrane District.

The U.T.M. for the property is approximately E480 000 N 5 631 800.

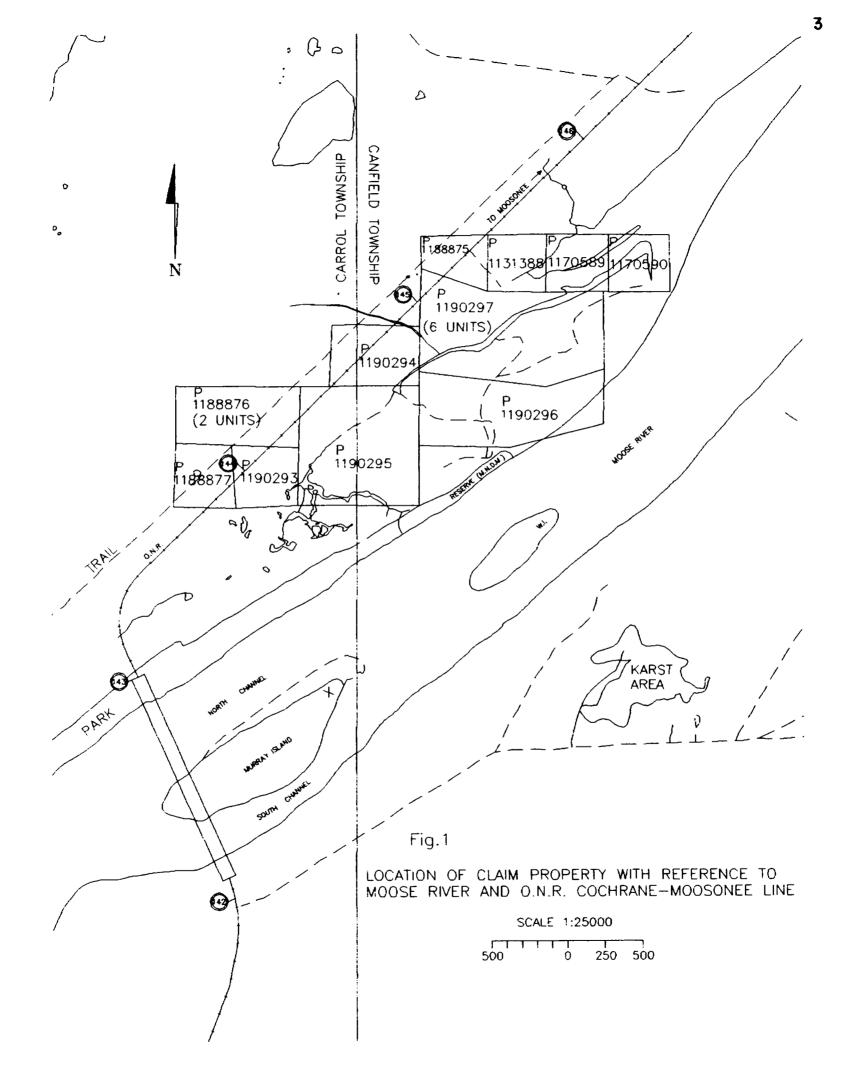
The Latitude/Longitude is approximately N50-50-20.48 and W 81-16-58.22

Figure 1 shows the property location with reference to the Moose River and the Ontario Northland Railway Cochrane - Moosonee Line.

Access was obtained along the O.N.R. line by snowmachine from Moosonee. A small trail was used to gain access to a cleared, semi-permanent camp site near railway milepost 144. The camp site was used for the duration of the survey work.

Topography and Vegetation

In general, the property is flat and low lying except for local topography, including old clay river levees up to 20 metres thick and 50 to over 200 metres wide. The old



levees trend approximately North-East, parallel to the modern Moose River (about 850 metres away)

For the most part, the property is covered with scrubby black spruce and jackpine but the ridges are dominated by large poplar and pine.

Exploration History

1923 James Bay Basin Oil Co. Ltd.

Regional drilling included 3 holes in Canfield Township.(Grey Goose Island)*

1926 Ontario Department of Mines (O.D.M)

Detailed geological study (includes map No. 1946.3)

1930 O.D.M.

Onakawana "A" lignite drillhole

1943 Moose River Oils Ltd.

Regional oil exploration included diamond drilling in Kilmer, Rapley and Hecla Townships.

1953 James Bay Basin Oil Company Ltd.

DDH 67 hit Moose River Formation (gypsum) for 80.7m, DDH 68 intersected 19.6m of massive gypsum.*

- 1955 A geological survey, reported by R.E. Parkes in assessment file T-634, found white and brown gypsum up to 15 ft. thick and up to 1600 ft. inland from the Moose River outcrops.
- 1990 James Bay Lowland Gypsum Development Group

Overburden depth survey and digital base map production.

1993 J.B.L.G.D.G.

Mechanical test pit digging.

1994 J.B.L.G.D.G.

Diamond drilling/geology

1995 J.B.L.G.D.G.

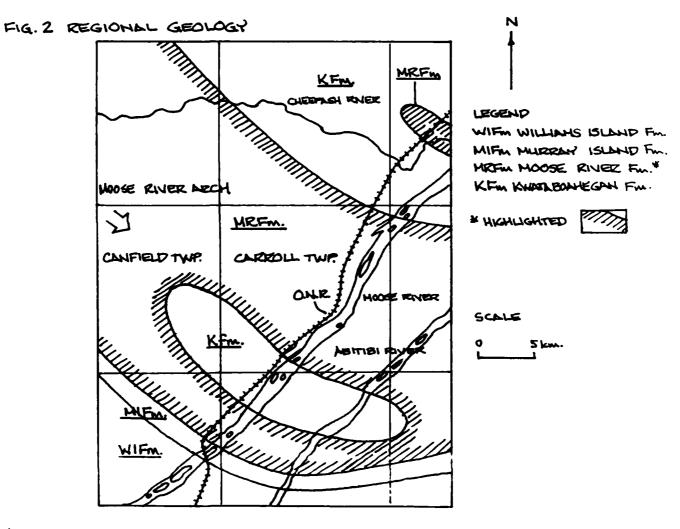
Topographic/geological survey and basic gypsum resource calculation.

* These cores are stored, along with many other James Bay Lowland drill cores, at the Ministry of Northern Development and Mines Core Library in Timmins, On.

Regional Geology

Regional geology consists of a Precambrian basement complex covered by proterozoic-Mesozoic, basinal carbonate rocks. The Moose River Formation represents a middle Devonian sequence of bedded, basinal carbonates and evaporites, including significant gypsum. The Moose River Formation is underlain by the fossiliferous limestones of the Kwataboahegan formation, and overlain by fossiliferous dolostones and argillaceous carbonates of the Murray Island Formation. The Moose River Formation Itself Displays a distinct scarcity of fossils.

The gypsum of the Moose River Formation is best developed along the North-West trending Moose River Arch. Gypsum outcrops over an elliptical area 70km by 17km., trending North-West. Three main surface exposures include the Moose River site, and the Gypsum Mountain site. (Fig. 2)



MODIFIED AFTER FIG.2, INDUSTRIAL MINERAL BACKGROUND PAPER 12, GYPSUM IN NOETHERN ONTARIO, MNDM 1990 pg. G

1995 Work

A topographic survey was carried out from January 3, 1996 to January 9, 1996 at the Moose River Gypsum property. The intent of this work was both to include, in one survey, all of the locations of the 1993 and 1994 test pits and drill holes, and to tie these sites into one common elevation datum (metres above Mean Sea Level). Once completed, this survey was tied to new topographic data (also obtained during this project) and tied to the Moose River outcrop locations with newly obtained outcrop elevations.

The completed survey was utilized to further calculate the basic gypsum resource available. Overburden volumes were also obtained by using this survey data. Diagram 3 shows the Basic Gypsum Resource Plan, Contour Map, and Section Locations.

A specific area was chosen for the gypsum resource model. (see dia #3) The choice of location and area of this gypsum block was guided by the following :

The North boundary of the gypsum block is formed by a clay ridge. This old clay river levee would make it difficult to continue removeing gypsum northward because it is a thick cover. It may also be desireable to leave this ridge undisturbed for the purpose of building a spur line for railway access.

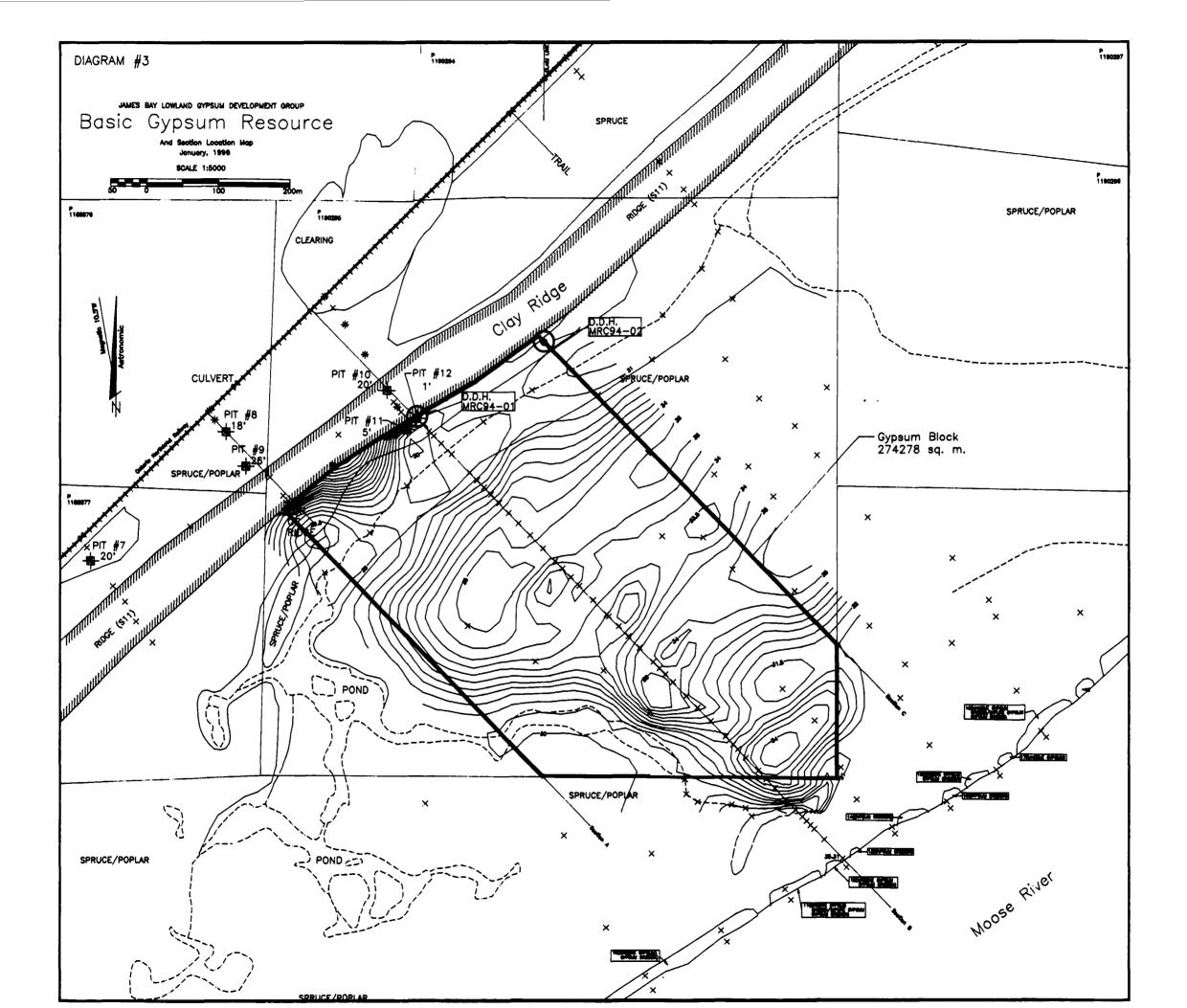
The West boundary is formed by drawing a line of shortest possible distance from test pit #9, to the gypsum outcrops along the Moose River. Test pit #9 was the Westernmost pit that produced high purity gypsum.

The East boundary is formed by drawing a line of shortest possible distance from drill hole MRC94-02, to the gypsum outcrops along the Moose River. This drill hole intercepted about 13m of gypsum, but ended there without ever leaving the gypsum.

The South boundary is formed by our property or claim boundary. It is not practical to include the ground outside of the property.

As can be seen on Fig. 3, the area of this resource block is 274, 278 sq. m. To our surprise, in every exposure the top of the gypsum deposit elevation was similar. Over the distances involved, they are basically the same. These elevations (above sea level) are as follows:

Pit #8	32.61m
Pit #9	31.95m
Pit #11	29.85m
Pit #12	31.86m



MRC 94-01	31.86m
MRC 94-02	31.90m
Moose River Outcrop	
Exposures	32.11m

The top of the gypsum deposit within our resource block can therefore basically be called 31.75m. The elevation of the Moose River, at section line B, is approximately 26.75m. This leaves 5m of gypsum above the elevation of the Moose River over the area of the resource block. This represents 1,371,390 cubic metres of gypsum. If mining were to proceed below the Moose River water elevation, to 15 m total thickness, as found in drill hole MRC 94-01, over the total area of the resource block, this would represent 4,114,170 cubic metres of gypsum.

Using Quicksurf surface modelling software, the volume of overburden over the area of the resource block was obtained down to elevation 31.75. (top of gypsum) The contoured surface shown in diagram #3 was used for this purpose. The volume obtained was 334,993 cubic metres. This equals almost exactly 1/4 of the volume of gypsum resource as calculated down to the Moose River elevation.

Maps were created using Autocad 12 with Quicksurf surface modelling software. Results are also summarized at the end of the report.

6

General Notes on Establishing Camp and the Topographic Survey

Camp was established at a semi-permanent campsite cleared during October of 1994, and accessed using snowmobiles from Moosonee. As a result of the cold, the unusually large snow accumulation, and the limited hours of daylight, travelling to the site and setting up camp required over one and a half days.

Because of a desire to minimize the ongoing impact of our assessment work, the survey was carried out without establishing cut lines on the property. This necessitated the use of snowshoes for the January field work, as snowmobiles were incapable of navigating the bush.

A two-person crew carried elevation along lines perpendicular to the railway, heading South-East to the Moose River. The lines followed a pre-planned azimuth, but skirted natural obstacles such as sinkholes.

The work was slowed only by the obstacles inherent to winter surveying and camping: cold weather during the field work, working hours limited by short winter days, and the fact that a significant portion of available daylight hours were spent on maintaining the camp.

Recommendations and Conclusions

A basic gypsum resource calculation, and overburden volume has been obtained for an area of land within the Moose River Crossing Gypsum Property. The ratio of overburden to gypsum is about 1 part overburden to four parts gypsum. This ratio becomes more favourable if gypsum is extracted below the Moose River elevation. This resource block represents only a portion of the property, the remainder of which is known to be similar geologically and topographically.

Future work could include a resource calculation for the remaining area within the property. This calculation would require similar groundwork such as diamond drilling, test pit digging and topographic survey. An engineering study could also be carried out to determine the feasibility of mining below the Moose River elevation.

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References

Cole, E., Geo. "Gypsum in Ontario" <u>Thirty Fourth Annual Report of the Ontario Dept. of Mines</u> Vol. XXXIV, Part II, 1925 pp. 1-34.

Gypsum in Northern Ontario; Resources and Market Potential Industrial Minerals Background Paper 12, 1990 M.N.D.M.

Appendix I

Moose River Gypsum Exploration Expense

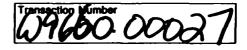
Direct Cost:

Wages: Cor	sultants				
Mapj	ping (by GeograFix, P): 2 person crew including survey instru	ments			
-2 days travel (Jan. 3 & Jan. 9) @ \$650/day					
	-5 days field work (Jan. 4-8) @\$800/day	\$4000			
Ore I	Reserve Calculation/Map Production				
	-55 hrs @ \$40.00/hr	\$2200			
Repo	rt Writing				
1	-15 hrs @ \$20.00/hr	\$300			
Equipment	Rental				
	-2 snowmobiles @ \$50 ea/day for 5 days	\$500			
	-tent, heater, camp equipment - flat rate from GeograFix	\$150			
	•				
Total Direc	rt Cost	<u>\$8450</u>			
Indirect (Cost:				
Transportat	ion				
I	-rail (2 people, Cochrane to Moosonee, return) -snowmobile supplies	\$154.08			
	(fuel, oil, maintenance supplies)	\$300.00			
Mob./Demo	b				
	-equipment freight (rail)	\$113.70			
	-transport equipment/people in Moosonee	\$125.00			
Food	- 2 people @ \$30/day ea for 7 days	\$210.00			
Lodging	- 2 people, 2 nights in Moosonee @\$40.00/night	\$80.00			
Total Indir	ect Cost	<u>\$982.78</u>			



Report of Work Conducted After Recording Claim

Mining Act



2.16433

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used for correspondence. Questions about this collection should be directed to the Provincial Manager, Mining Lands, Ministry of Northern Development and Mines, Fourth Floor, 159 Cedar Street, Sudbury, Ontario, P3E 6A5, telephone (705) 670-7264.

Instructions:	 Please type or print and submit in duplicate.
	Defeate the Mining Ast and Deputations for a

- Refer to the Mining Act and Regulations for r Recorder.
- A separate copy of this form must be comple
- Technical reports and maps must accompany
- A sketch, showing the claims the work is ass

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Recorded Holder(s) Kern Mark KEAN	Client No.	20650 151090	
Address R T	Po. 60x 2120, Timmus, Telephon DN PHN 427 ON. 788 (705	10 No.) 264-6718	
Mining Division Township		⁵ lan No.	
Vark Performed From: Dec. 28, 1995	To: Jan 12, 1996		

Work Performed (Check One Work Group Only)

Work Group	Туре
Geotechnical Survey	For Gypsum Resource Calculation (CHIER)
Physical Work, Including Dtilling	
Rehabilitation	RECEIVED
Other Authorized Work	FEB 2 0 1996
Assays	MINING LANDS BRANCH
Assignment from Reserve	

Total Assessment Work Claimed on the Attached Statement of Costs \$ ______

Note: The Minister may reject for assessment work credit all or part of the assessment work submitted if the recorded holder cannot verify expenditures claimed in the statement of costs within 30 days of a request for verification.

³ersons and Survey Company Who Performed the Work (Give Name and Address of Author of Report)

Name	Address			
T. Roll-Passmore B. Geog.				
"GeograFix"	Box 1726, stn Main, Timmius, Ow PHN 7609			
Kevin Cool				
"General Surveys + Exploration	190 Queen Ave., Timmins, ON P4N 417			

attach a schedule if necessary)

Certification of Beneficial Interest * See Note No. 1 on reverse side

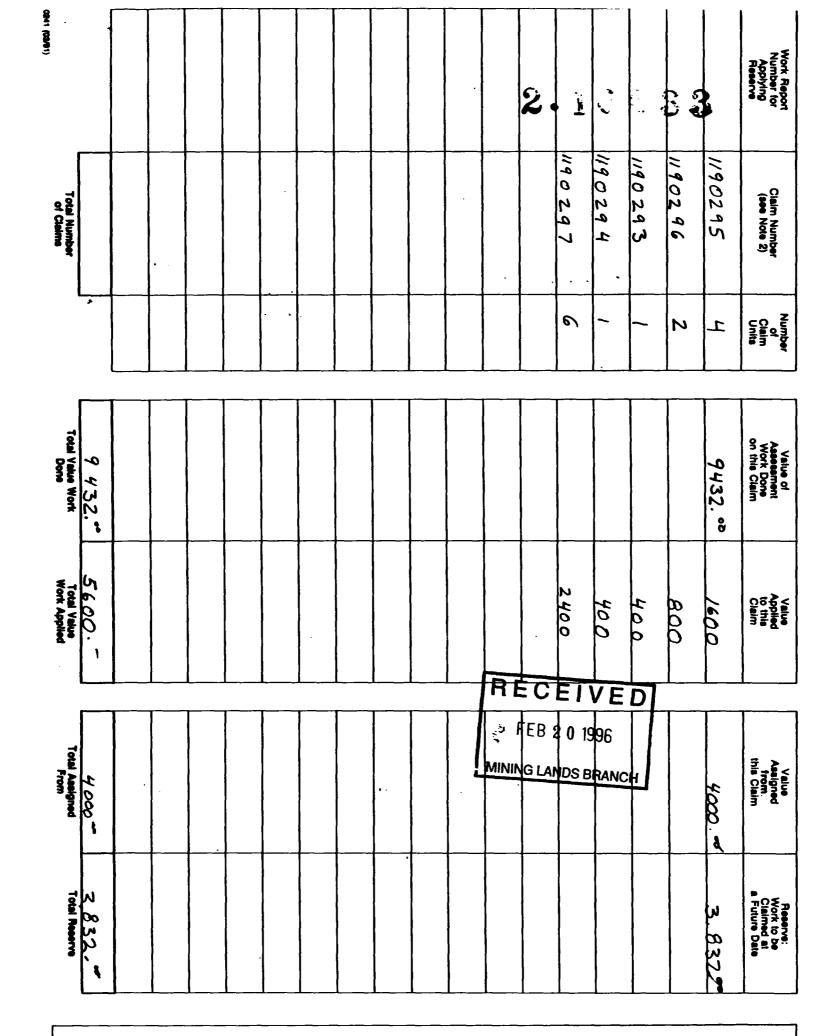
I certify that at the time the work was performed, the claims covered in this work	Dele	Recorded Holder or Agent (Signature)
report were recorded in the current holder's name or held under a beneficial interest	JAN 12/96	
by the current recorded holder.		la Q

:ertification of Work Report

I certify that I have a personal knowledge of the facts set forth in this Work report, having performed the work or witnessed same during and/or after							
its completion and annexed report is	, true.						-
lame and Address of Person Certifying							
K. Col	190	QUEEN	Ave,	Timmins,	٥N٠	P4N	417
elepone No.	Date			Certified	d By (Sign	ature)	

264-6718	JAN.	12/96	Klind		
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Credits you are claiming in this report may be cut back. In order to minimize the adverse effects of such deletions, please indicate from which claims you wish to priorize the deletion of credits. Please mark (\sim) one of the following:

1. Credits are to be cut back starting with the claim listed last, working backwards.

2. Credits are to be cut back equally over all claims contained in this report of work.

3. If Credits are to be cut back as priorized on the attached appendix.

In the event that you have not specified your choice of priority, option one will be implemented.

Note 1: Examples of beneficial interest are unrecorded transfers, option agreements, memorandum of agreements, etc., with respect to the mining claims.

Note 2: If work has been performed on patented or leased land, please complete the following:

I certify that the recorded holder had a beneficial interest in the patented	Signature	Date
or leased land at the time the work was performed.	lindow	Jan. 12/96

Ministry of Forthern Development and Mines

Ministère du Développement du Nord et des mines

Statement of Costs for Assessment Credit

État des coûts aux fins du crédit d'évaluation

Mining Act/Loi sur les mines

Personal information collected on this form is obtained under the authority of the Mining Act. This information will be used to maintain a record and ongoing status of the mining claim(s). Questions about this collection should be directed to the Provincial Manager, Minings Lands, Ministry of Northern Development and Mines, 4th Floor, 159 Cedar Street, Sudbury, Ontario P3E 6A5, telephone (705) 670-7264.

1. Direct Costs/Coûts directs

Туре	Description	Amount Montant	Totais Totai giobai
Wages Selaires	Labour Main-d'oeuvre		
	Field Supervision Supervision sur le terrain		
Contractor's and Consultant's Face	Type Mappy Kurvey - Tield	\$53,00-	
Droits de l'entrepreneur	Mappy Kurvey - Tield Dre Reserve Cak/Datting	\$2200	
et de l'expert- conseil	Report Writing	300	* 7800
Supplies Used Fournitures utilisées	Турві		
Equipment Rentai Location de	Snowmobiles	* 500	
matériei	Comp Equipment_	\$ 150	
			+ 650
	8450 -		

Note: The recorded holder will be required to verify expenditures claimed in this statement of costs within 30 days of a request for verification. If verification is not made, the Minister may reject for assessment work all or part of the assessment work submitted.

Filing Discounts

- 1. Work filed within two years of completion is claimed at 100% of the above Total Value of Assessment Credit.
- 2. Work filed three, four or five years after completion is claimed at 50% of the above Total Value of Assessment Credit. See calculations below:

Total Value of Assessment Credit × 0.50 =

Certification Verifying Statement of Costs

A pa I hereby certify:

I hereby certify: that the amounts shown are as accurate as possible and these costs were incurred while conducting assessment work on the lands shown on the accompanying Report of Work form.

that as (Ber

I am authorized Agent, Position in Company)



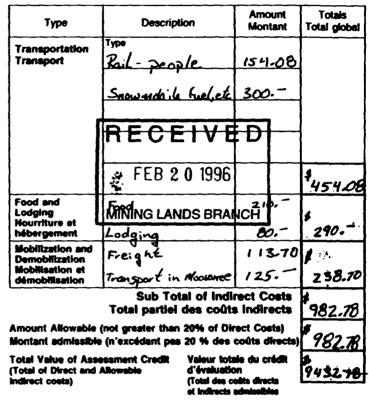
Transaction No./N* de transaction 2.16433

Les renseignements personnels contenus dans la présente formule sont recueillis en vertu de la Loi sur les mines et serviront à tenir à jour un registre des concessions minières. Adresser toute question sur la collece de ces renseignements au chef provincial des terrains miniers, ministère du Développement du Nord et des Mines, 159, rue Cedar, 4^e étage, Sudbury (Ontario) P3E 6A5, téléphone (705) 670-7264.

2. Indirect Costs/Coûts indirects

Note: When claiming Rehabilitation work Indirect costs are not allowable as assessment work. Pour le remboursement des travaux de réhabilitation, les coûts indirects ne sont pas admissibles en tant que travaux

d'évaluation.



Note : Le titulaire enregistré sera tenu de vérifier les dépenses demandées dans le présent état des coûts dans les 30 jours suivant une demande à cet effet. Si la vérification n'est pas effectuée, le ministre peut rejeter tout ou une partie des travaux d'évaluation présentés.

Remises pour dépôt

- 1. Les travaux déposés dans les deux ans suivant leur achèvement sont remboursés à 100 % de la valeur totale susmentionnée du crédit d'évaluation.
- 2. Les travaux déposés trois, quatre ou cinq ans après leur achèvement sont remboursés à 50 % de la valeur totale du crédit d'évaluation susmentionné. Voir les calculs ci-dessous.

Valeur totale du crédit d'évaluation	5		-igiala	demand	
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	111			6	5
Attestation de l'état des coûts	133	JAN	12	194ı	Č
J'atteste par la présente :					
que les montants indiqués sont le dépenses ont été engagées pour eff			Sillin Vaux d		S
sur les terrains indiqués dans la form					xint

à faire cette attestation.

Signature Jan. 12/96 to

Nota : Dans cette formule, lorsqu'il désigne des personnes, le masculin est utilisé au sens neutre.

Total Assessment Claimed



Ministère du Ministry of Geoscience Approvals Office Développement du Nord Northern Development 933 Ramsey Lake Road et des Mines and Mines 6th Floor Sudbury, Ontario P3E 6B5 Telephone: (705) 670-5853 (705) 670-5863 Fax: April 09, 1996 Our File: 2.16433 Transaction **#:** W9660.00027

Mining Recorder Ministry of Northern Development & Mines 60 Wilson Avenue, 1st Floor Timmins, Ontario P4N 2S7

Dear Sir:

Subject: APPROVAL OF ASSESSMENT WORK CREDITS ON MINING CLAIM P.1190295 IN CARROL & CANFIELD TOWNSHIPS

Assessment work credits have been approved as outlined on the original submission. The credits have been approved under Section 18 (9) Data, Mining Act Regulations.

The approval date is April 04, 1996.

If you have any questions regarding this correspondence, please contact Lucille Jerome at (705) 670-5858.

Yours Sincerely, ORIGINAL SIGNED BY:

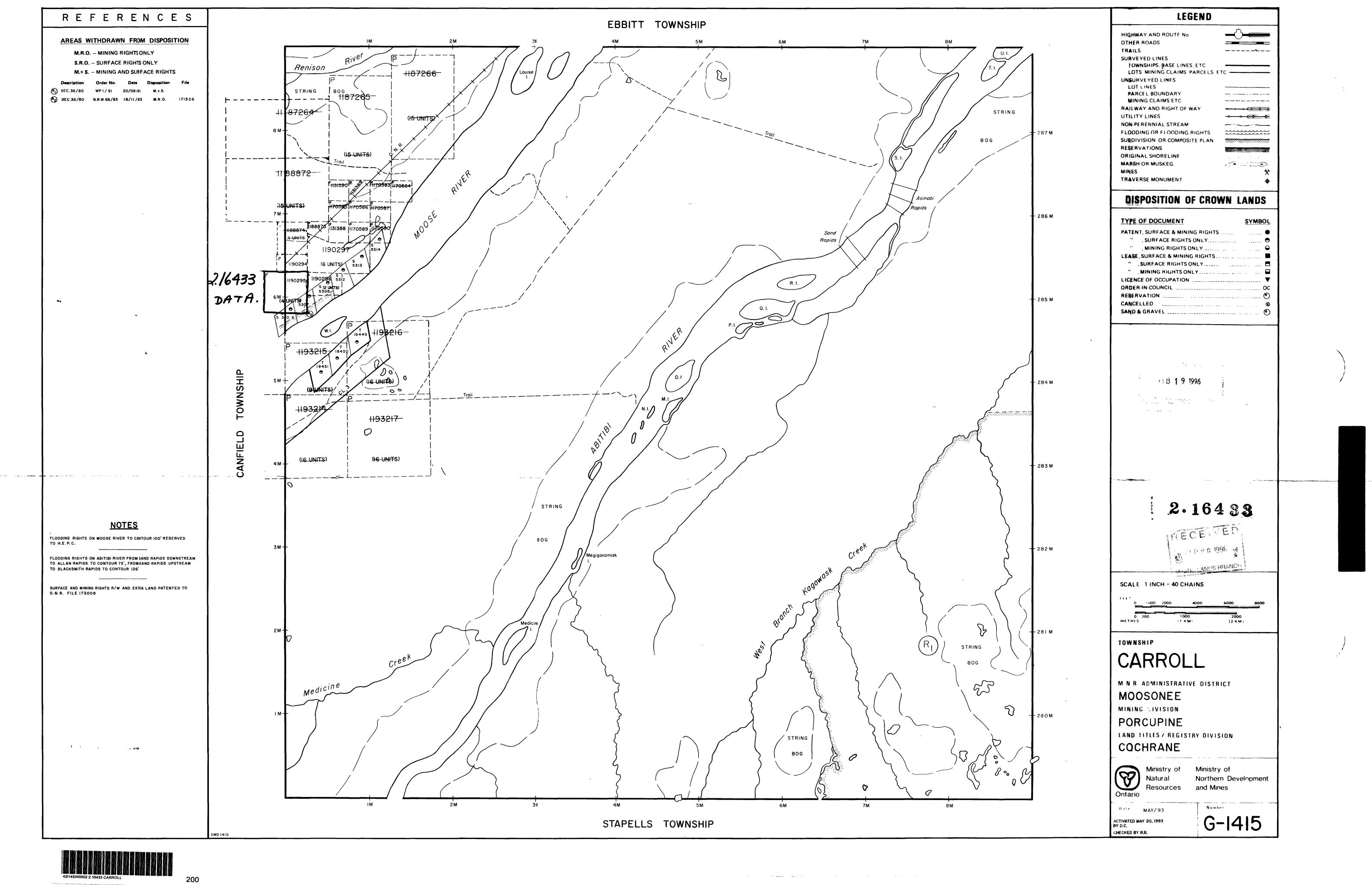
Roncod.

Ron C. Gashinski Senior Manager, Mining Lands Section Mining and Land Management Branch Mines and Minerals Division

LJ/jl Enclosure:

> cc: Resident Geologist Timmins, Ontario

Assessment Files Library Sudbury, Ontario



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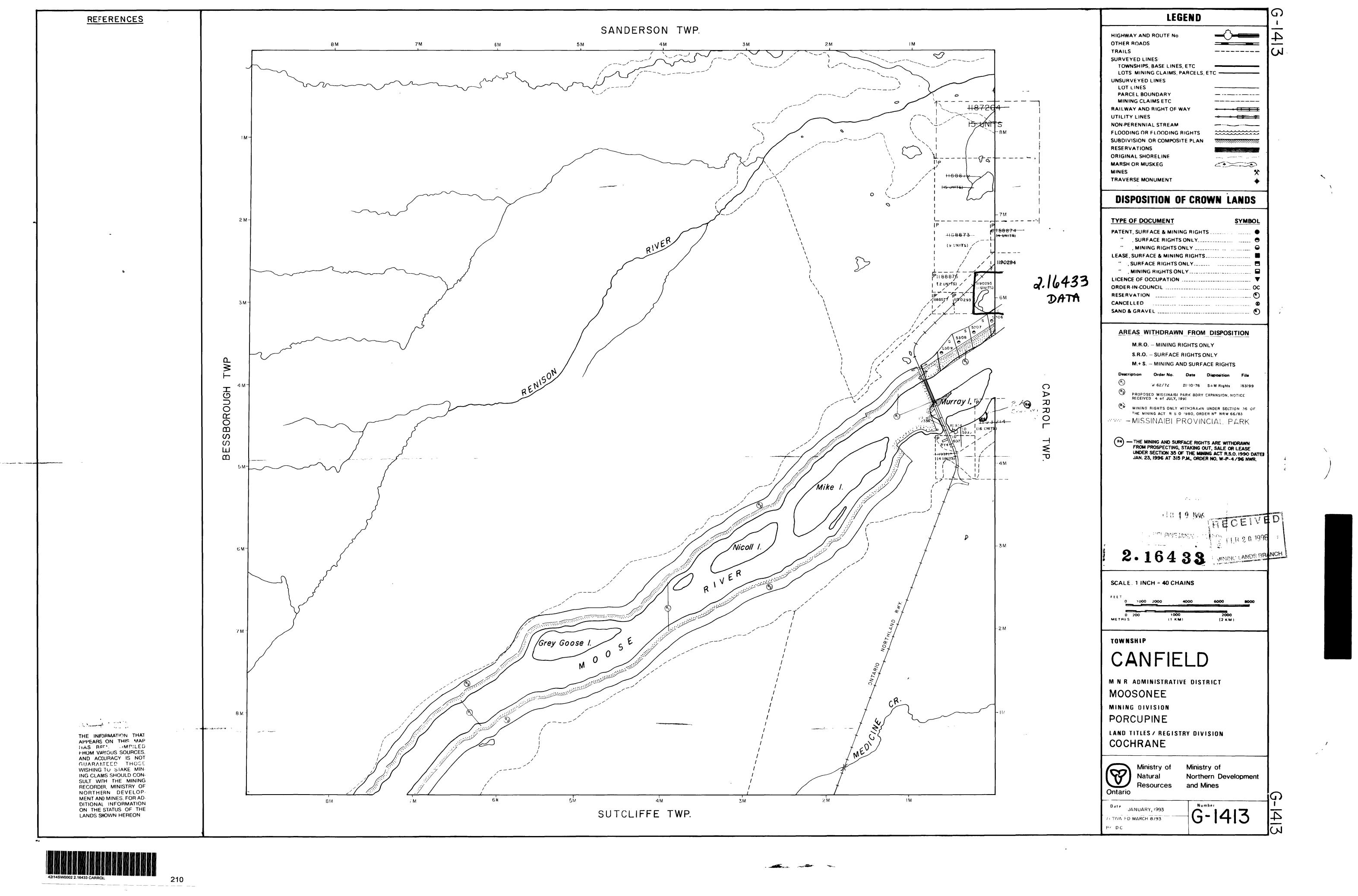
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