

# INDEPENDENT TECHNICAL REPORT

## Nicobat Project, Rainy River Area, Ontario

Prepared for:  
Crystal Lake Mining Corp.



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February 5, 2018

## TABLE OF CONTENTS

<b>1.0</b>	<b>SUMMARY</b> .....	<b>4</b>
<b>2.0</b>	<b>INTRODUCTION</b> .....	<b>5</b>
2.1	TERMINOLOGY .....	6
2.2	UNITS.....	6
2.3	QUALIFICATIONS .....	6
<b>3.0</b>	<b>RELIANCE ON OTHER EXPERTS</b> .....	<b>8</b>
<b>4.0</b>	<b>PROPERTY DESCRIPTION AND LOCATION</b> .....	<b>8</b>
4.1	PERMITS.....	8
4.2	OWNERSHIP.....	14
	4.2.1 Claim 4271029.....	14
	4.2.2 Claims held by Emerald Lake .....	14
<b>5.0</b>	<b>ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY</b> .....	<b>16</b>
5.1	ACCESS.....	16
5.2	CLIMATE.....	17
5.3	PHYSIOGRAPHY AND VEGETATION.....	17
5.4	INFRASTRUCTURE AND LOCAL RESOURCES.....	17
<b>6.0</b>	<b>HISTORY</b> .....	<b>18</b>
6.1	POTTS TOWNSHIP/NORTHERN MATHER AND KINGSFORD TOWNSHIPS .....	18
	6.1.1 Canadian Nickel Company (“Inco”) (1972-73).....	19
	6.1.2 Walter Cummings (1988-89).....	19
	6.1.3 Noranda (1995).....	20
	6.1.4 Puskas & Allen (1997).....	20
	6.1.5 Rainy River Resources (2007).....	21
6.2	DOGPAW LAKE/HERONRY LAKE AREAS.....	21
	6.2.1 Inco (1969, 1984).....	21
	6.2.2 Hudson Bay Exploration and Development Company Ltd. (1975).....	22
	6.2.3 Hornby Bay Exploration Ltd. (2000).....	22
	6.2.4 Western Warrior Resources (2008).....	22
<b>7.0</b>	<b>GEOLOGICAL SETTING AND MINERALIZATION</b> .....	<b>23</b>
7.1	REGIONAL GEOLOGY.....	23
7.2	LOCAL GEOLOGY .....	25
	7.2.1 Southern Claim Groups .....	25
	7.2.2 Northern Claim Group.....	25
7.3	STRUCTURE .....	26

7.4	PROPERTY GEOLOGY .....	27
	7.4.1 <i>Dobie Township Claims</i> .....	27
	7.4.2 <i>Tait and Mather Township Claims</i> .....	28
	7.4.3 <i>Potts/Kingsford/northern Mather Township Claims</i> .....	28
	7.4.4 <i>Dogpaw Lake Area/Heronry Lake Area Claims</i> .....	28
7.5	MINERALIZATION .....	31
<b>8.0</b>	<b>DEPOSIT TYPES .....</b>	<b>31</b>
<b>9.0</b>	<b>EXPLORATION .....</b>	<b>32</b>
9.1	GROUND GEOPHYSICS – MAGNETIC AND VLF SURVEY .....	32
<b>10.0</b>	<b>DRILLING .....</b>	<b>36</b>
<b>11.0</b>	<b>SAMPLE PREPARATION, ANALYSES AND SECURITY .....</b>	<b>38</b>
<b>12.0</b>	<b>DATA VERIFICATION .....</b>	<b>39</b>
12.1	SITE VISIT .....	39
12.2	QUALITY CONTROL ANALYSIS .....	40
12.3	GROUND MAG-VLF SURVEY .....	41
<b>13.0</b>	<b>MINERAL PROCESSING AND METALLURGICAL TESTING.....</b>	<b>41</b>
<b>14.0</b>	<b>MINERAL RESOURCE ESTIMATES.....</b>	<b>41</b>
<b>15.0</b>	<b>ADJACENT PROPERTIES .....</b>	<b>41</b>
<b>16.0</b>	<b>OTHER RELEVANT DATA AND INFORMATION .....</b>	<b>42</b>
<b>17.0</b>	<b>INTERPRETATION AND CONCLUSIONS .....</b>	<b>42</b>
<b>18.0</b>	<b>RECOMMENDATIONS.....</b>	<b>43</b>
18.1	RECOMMENDED PHASE 1 PROGRAM – GEOPHYSICAL SURVEY .....	43
18.2	RECOMMENDED PHASE 2 PROGRAM – DRILLING PROGRAM .....	43
<b>19.0</b>	<b>REFERENCES .....</b>	<b>45</b>
<b>20.0</b>	<b>STATEMENT OF AUTHORSHIP .....</b>	<b>48</b>

## FIGURES

Figure 4-1: Location of the property in northwestern Ontario.....	10
Figure 4-2: Map showing Crystal Lake’s southern claim group.....	12
Figure 4-3: Map showing Crystal Lake’s northern claim group.....	13

Figure 5-1: Access to the claims that are the subject of this report ..... 18  
 Figure 7-1: Location of the Wabigoon subprovince (modified from Frieman et al., 2017). ..... 24  
 Figure 7-2: Local Geology..... 27  
 Figure 7-3: Geology of the southern claim group..... 29  
 Figure 7-4: Geology of the northern claim group..... 30  
 Figure 8-1: Schematic model for the formation of Ni-Cu-PGE deposits (from Begg, et al. 2010)..... 32  
 Figure 9-1. Results of the Farm ground magnetic survey ..... 34  
 Figure 9-2. Results of the Farm ground VLF survey, 24.8 kHz. red = in phase, blue = quadrature, green = total field ..... 35  
 Figure 10-1: Location of diamond drill hole A-0-15 on the Nico2 prospect.....37

TABLES

Table 4-1: List of claims of the Nicobat property.....11  
 Table 4-2: List of claims that are part of the option and purchase agreement..... 15  
 Table 4-3: Claims included in the purchase agreement..... 15  
 Table 6-1: Overview of historic work completed on Crystal Lake’s claim in Potts, Kingsford and northern Mather townships..... 18  
 Table 6-2: List of drill holes completed by Canadian Nickel Co. in 1972/73..... 20  
 Table 6-3: List of drill holes completed by Puskas and Allen in 1997. .... 20  
 Table 6-4: Historic exploration in the area of Crystal Lake’s claim in Dogpaw Lake and Heronry Lake areas..... 21  
 Table 7-1: Descriptions of the sills in the Dogpaw Lake Area (Davies and Morin 1976). .... 26  
 Table 10-1: Details of drill hole A-0-15 drilled on claim 4271029 in 2015..... 36  
 Table 10-2: List of drill core samples collected from drill hole A-0-15 with assay results. .... 36  
 Table 12-1: Assay results of drill core samples collected during the personal inspection..... 39  
 Table 12-2: List of blanks inserted by Actlabs. .... 40  
 Table 12-3: List of standards inserted by Actlabs..... 40  
 Table 18-1: Cost estimate of the recommended Phase 1 exploration program..... 43  
 Table 18-2: Cost estimate of the recommended Phase 2 exploration program..... 44

APPENDICES

Appendix 1 – Certificates of Qualified Persons

## 1.0 SUMMARY

Crystal Lake Mining Corp. (“Crystal Lake”) retained Ronacher McKenzie Geoscience Inc. (“Ronacher McKenzie”) and Lightfoot Geoscience Inc. (“Lightfoot Geoscience”) to prepare an Independent Technical Report on Crystal Lake’s Nicobat Project near Fort Frances, Ontario.

The property consists of 27 non-contiguous, unpatented mineral claims covering a total of 4,224 ha in seven townships. Claims 4273688 and 4276458 are fully owned by Crystal Lake. Crystal Lake holds a 15% interest in claim 4271029 with the right to increase its interest to 60% by paying \$2,000,000 to Emerald Lake Development Corp. (“Emerald Lake”), the holder of the mineral rights to this claim. Crystal Lake has the right to increase its interest to 85% by paying \$8,000,000 to Emerald Lake with the option to obtain the remaining 15%. All other claims are subject to an agreement dated September 27, 2016, in which Emerald Lake granted Crystal Lake the right of first refusal to purchase 100% interest in the claims. Crystal Lake chose to exercise this right of first refusal on September 28, 2017 and Emerald Lake agreed to vend 100% interest in the claims to Crystal Lake in exchange for shares. As of the effective date of this report, the transaction is subject to regulatory approval. The property remains subject to a net smelter return (“NSR”) of 2%.

The area has been explored for Ni-Cu-PGE sulfide mineralization since the early 1950s but no major deposit has been found to date.

The property is located in the Wabigoon subprovince (Superior Province) of the Canadian Shield. The claims in Dobie, Mather, Kingsford, Potts and Tait townships are located in the Rainy River Block, which is characterized by metavolcanic rocks into which large felsic and smaller mafic-ultramafic intrusions were emplaced. The claims in Dogpaw Lake and Heronry Lake areas are located in the Kakagi-Rowan greenstone belt; sills of mafic-ultramafic rocks intruded into metavolcanic rocks. Mineralization was intersected in claim 4271029; it consists of semi-massive breccia and disseminated sulfides, dominantly pyrrhotite (60-70%) with some pentlandite (10%) and minor chalcopyrite. Elsewhere in the area, Ni-Cu-PGE occurrences are associated with mafic-ultramafic intrusions.

Crystal Lake completed a magnetic and VLF survey on claim 4271029 in 2015. No significant magnetic or electromagnetic signatures were noted on the survey apart from that of a powerline. In addition, one diamond drill hole was completed in the same year (A-0-15). The drill hole intersected gabbro and pyroxenite and up to 10% disseminated sulfides (pyrrhotite, pentlandite, chalcopyrite). Twelve drill core samples were collected by Crystal Lake for assaying; grades of up to 0.226% Ni and 0.219% Cu over 0.91 m and 0.547% Ni and 0.218% Cu over 0.42 m were returned.

A personal inspection of the historic drill core was completed by Dr. Peter Lightfoot, P.Geo., and Dr. Elisabeth Ronacher, P.Geo., from June 6 to 8, 2017. They visited claim 4271029, inspected the drill hole collar location and reviewed drill core. Dr. Lightfoot visited the property again from October 22nd, 2017, and collected 22 core samples from drill core A-0-15. Assay results of these samples are comparable with the original samples.

Based on the geological setting of the property, the historic exploration data and the limited current exploration results, Lightfoot and Ronacher conclude that potential exists to discover Ni-Cu-PGE sulfide mineralization on the claims comprising the Nicobat Project.

We recommend an airborne magnetic and electromagnetic (mag-EM) survey over the property to determine magnetic and coincident EM anomalies that could represent mafic-ultramafic intrusions that potentially contain Ni-Cu-PGE sulfide mineralization. We further recommend drill testing these anomalies should any be identified.

## 2.0 INTRODUCTION

Crystal Lake Mining Corp. (“Crystal Lake”) commissioned Ronacher McKenzie Geoscience (“Ronacher McKenzie”) and Lightfoot Geoscience Inc. (“Lightfoot Geoscience”) to prepare an Independent Technical Report (“the report”) in accordance with National Instrument 43-101 -- *Standards of Disclosure for Mineral Projects* (“NI 43-101”) on certain claims of Crystal Lake’s Nicobat Project located in the Rainy River District near Fort Frances, Ontario.

The purpose of the report is to satisfy filing requirements of the TSX Venture Exchange related to the purchase of mineral rights of certain mining claims by Crystal Lake. As of the effective date of this report, the agreement is subject to regulatory approval. Another purpose is to compile information that will allow Crystal Lake to make informed decisions about exploration in the project area footprint.

The main source of information comprised legacy data provided by Crystal Lake upon the agreement by Ronacher McKenzie (dated December 14, 2016) and Lightfoot Geoscience (dated April 1, 2017) to undertake consulting work for Emerald Lake as the geological contractor to Crystal Lake. Crystal Lake provided a compilation of company exploration data including drill hole information and reports. Historic information and geological literature was obtained from the public domain, dominantly the Ontario Geological Survey (“OGS”).

Dr. Peter Lightfoot, P.Geo. and Dr. Elisabeth Ronacher, P.Geo. visited the property on June 6 to 8, 2017. They reviewed core from drill hole A-0-15, which was drilled on claim 4271029. They also

inspected the drill hole location. Dr. Lightfoot visited the property again on October 22, 2017, and collected samples from drill hole A-0-15.

## 2.1 Terminology

**EM:** electromagnetic; geophysical exploration method based on the measurement of alternating magnetic fields associated with currents artificially or naturally maintained in the subsurface (Bates and Jackson 1980)

**MNDM:** Ministry of Northern Development and Mines

**ICP-MS:** Induced coupled plasma mass spectrometry

**OES:** Optical Emission Spectroscopy

**OGS:** Ontario Geological Survey

**PGE:** Platinum group elements

**PGM:** Platinum group metals

**QP:** Qualified Person

**TSX:** Toronto Stock Exchanges

**VLF:** Very low frequency; geophysical method that uses radio communication signals to determine the electrical property of bedrock.

## 2.2 Units

The metric system of measurement is used in this report. Historic data are typically reported in imperial units and were converted for this report using appropriate conversion factors. Ounces per (short) ton are converted to grams per (metric) tonne using the conversion factor of 34.2857. One foot is 0.3048 m. One gamma (unit of magnetic intensity) is  $1 \times 10^{-9}$  T or 1 nT. Surface area is given in hectares (ha). 1 ha is 2.47 acres. All dollar values are in Canadian dollars except where noted otherwise.

Universal Transverse Mercator (UTM) coordinates are provided in the datum of NAD83, Zone 15N.

## 2.3 Qualifications

Ronacher McKenzie Geoscience is an international consulting company with offices in Toronto and Sudbury, Ontario, Canada. Ronacher McKenzie's mission is to use intelligent geoscientific data integration to help mineral explorationists focus on what matters to them. We help a growing number of clients understand the factors that control the location of mineral deposits.

With a variety of professional experience, our team's services include:

- Data Integration, Analysis and Interpretation
- Geophysical Services
- Project Generation and Property Assessment
- Exploration Project Management
- Resource Estimation and Independent Technical Reporting
- Project Promotion
- Lands Management

The Qualified Person and co-author of this Report is Peter Lightfoot, PhD, P.Geo. Dr. Lightfoot is founder, President, and Chief Geologist of Lightfoot Geoscience Inc, and a geologist in good standing of the Association of Professional Geoscientists of Ontario (APGO #671). Dr. Lightfoot has worked as a geologist since 1985 with academia, government, and industry. Dr Lightfoot has 20 years experience with Inco and more recently Vale, working on the Sudbury, Thompson, Voisey's Bay, and Carajas mining properties and on technical support and international project generation in the area of Ni-Cu-Co-Pt-Pd-Au-Ag sulfide mineralization and Ni-Co laterites. In 2017, he published the first comprehensive textbook on the origin of the Sudbury ore deposits and their relationship to the impact melt sheet. Dr. Lightfoot has published numerous papers on nickel sulfide ore deposits, methods of rock and mineral analysis, and company reports. Dr. Lightfoot is responsible for co-authoring the content of this report, and has provided recommendation on exploration of the Nicobat Property.

Another Qualified Person and co-author is Elisabeth Ronacher PhD, P.Geo. Dr. Ronacher is co-founder and Principal Geologist to Ronacher McKenzie Geoscience and a geologist in good standing of the Association of Professional Geoscientists of Ontario (APGO #1476). Dr. Ronacher has worked as a geologist since 1997 with academia and industry on a variety of exploration properties such as Au, Cu, bas-metal, Cu-Ni PGE and U. Dr. Ronacher has written numerous Independent Technical Reports (NI 43-101) on a variety of deposit types. Dr. Ronacher is responsible for all sections of this report except Section 9 (Exploration) and visited the Property.

Another Qualified Person and co-author of this Report is Ms. Jenna McKenzie, P.Geo. Ms. McKenzie is co-founder and Principal Geophysicist to Ronacher McKenzie Geoscience and a geoscientist in good standing with the Association of Professional Geoscientists of Ontario (APGO #1653). Ms. McKenzie has worked as a geophysicist since 2001 in the exploration and mining industry on a variety of exploration properties such as porphyry-copper, gold, VMS, Ni-Cu-PGE, diamond-bearing-kimberlite and potash. Ms. McKenzie has co-written several Independent Technical Reports (NI 43-101) on a variety of deposit types with specific focus on geophysical surveying and interpretation. Ms.



McKenzie is responsible for Section 9 (Exploration) and section 12.3 (Data Verification – Ground Mag-VLF Survey of this report and did not visit the Property).

Certificates of the Qualified Persons are provided in Appendix 1.

### **3.0 RELIANCE ON OTHER EXPERTS**

Ronacher McKenzie and Lightfoot Geoscience relied on information provided by Crystal Lake regarding ownership of the property. The QP reviewed the status of mineral claims on the website of the Government of Ontario, Ministry of Northern Development and Mines (“MNDM”) ([http://www.mci.mndm.gov.on.ca/claims/clm\\_mmen.cfm](http://www.mci.mndm.gov.on.ca/claims/clm_mmen.cfm)) on February 5, 2018. While title documents, option agreements and purchase agreements were reviewed for this report, this report does not constitute nor is intended to represent a legal or any other opinion to title.

### **4.0 PROPERTY DESCRIPTION AND LOCATION**

The property held as part of the Nicobat Project is located in the Rainy River area of northwestern Ontario (Figure 4-1). The property consists of 27 non-contiguous mining claims in six Townships and Areas covering a total surface area of 4,224 ha (Table 4-1). All claims except two (claims 4273688 and 4276458) are held by Emerald Lake Development Corp. (“Emerald Lake”). Mineral claims 4273688 and 4276458 are held by Crystal Lake. The locations of the claims are shown on Figure 4-2 and Figure 4-3.

Legal access to the properties is via provincial highways and roads (Figure 4-2, Figure 4-3). Crystal Lake does not own the surface rights of the claims except for claim 4271029.

The QP is not aware of any environmental liabilities on the property. Permits are required to conduct exploration work on the property.

#### **4.1 Permits**

In Ontario, permits are generally required for exploration on unpatented mineral claims or leases.

Exploration activities such as geophysical surveys requiring a power generator, line cutting where the line width is less than 1.5 m, mechanized drilling where the total weight of the rig is less than 150 kg, mechanized surface stripping where the total stripped area is less than 100 m<sup>2</sup>, or pitting and trenching of a volume of 1 to 3 m<sup>3</sup> on unpatented mineral claims or leases require an exploration plan. Exploration permits are required for line cutting where the line width exceeds 1.5 m, for drilling where the weight of the drill exceeds 150 kg, mechanized stripping of an area greater than 100 m<sup>2</sup>

and for pitting and trenching where the total volume of rock is more than 3 m<sup>3</sup>. Plan and permit applications are submitted to the MNDM for review. The MNDM then posts these on the Environmental Registry for 30 days and circulates them to First Nations communities who have areas of cultural significance. Plans are typically approved within 30 days and permits within 60 days. Plans are valid for two years and permits are valid for three years.

No exploration plans or permits are generally required for fee simple absolute patents and for areas that are part of a closure plan. All surface rights holders must be notified of the application in advance of the submission.

Crystal Lake does not have exploration permits or plans and has not applied for permits or plans as of the effective date of this report.

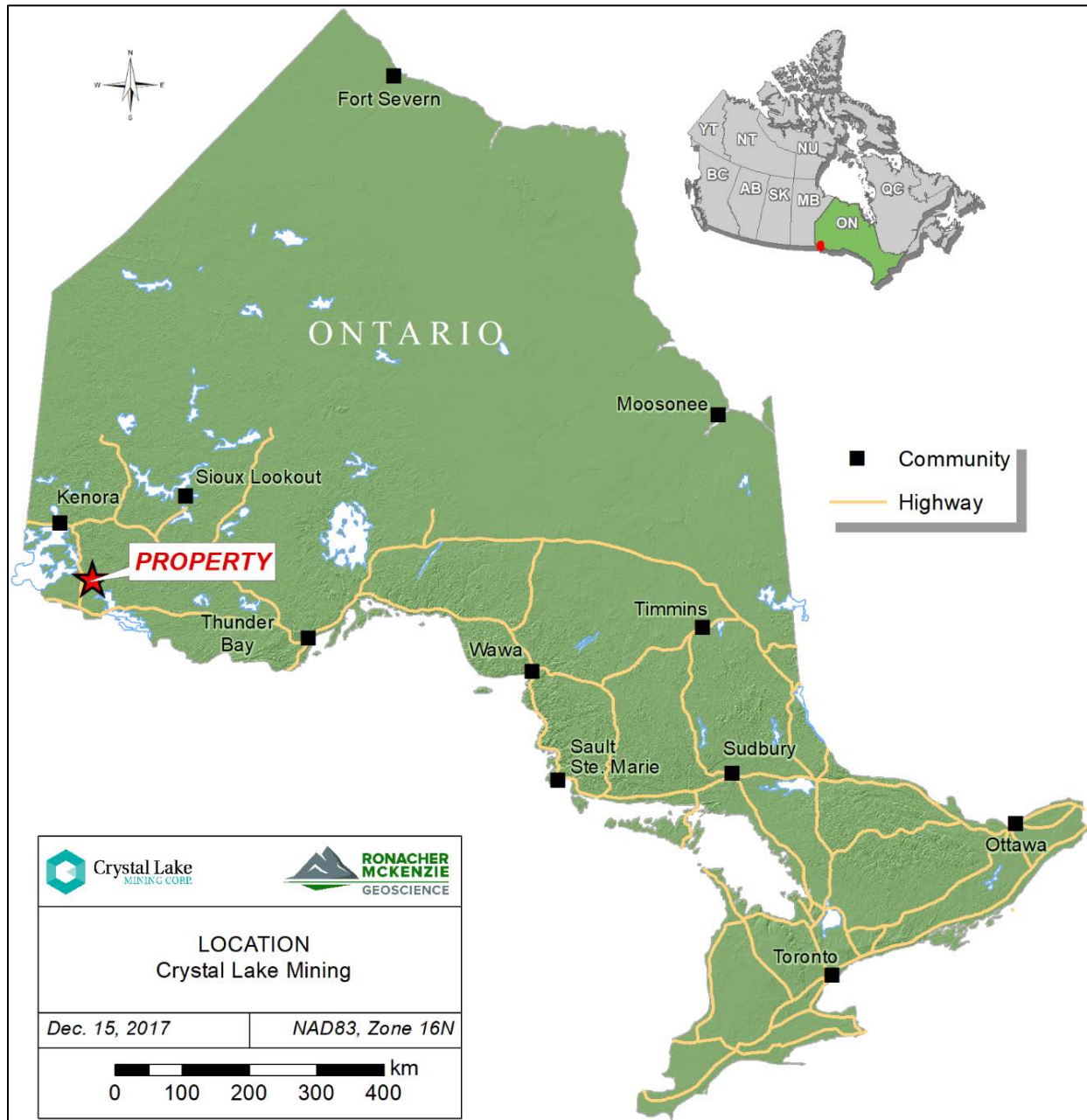


Figure 4-1: Location of the property in northwestern Ontario.

Table 4-1: List of claims of the Nicobat property.

Claim Number	Claim Due Date	Owner	Township / Area	Claim Units	Area (ha)	Area (acres)
4271029	2020-Dec-30	ELDC	DOBIE	4	64	158
4273689	2019-Feb-12	ELDC	DOBIE	4	64	158
4276458	2019-Nov-27	Crystal Lake	DOBIE	2	32	79
4267685	2019-Jan-13	ELDC	DOGPAW LAKE AREA	4	64	158
4267689	2019-Jan-13	ELDC	DOGPAW LAKE AREA	4	64	158
4267693	2019-Jan-13	ELDC	DOGPAW LAKE AREA	4	64	158
4267696	2019-Jan-12	ELDC	DOGPAW LAKE AREA	6	96	237
4267697	2019-Jan-12	ELDC	DOGPAW LAKE AREA	16	256	633
4267686	2019-Jan-13	ELDC	HERONRY LAKE AREA	16	256	633
4267687	2019-Jan-13	ELDC	HERONRY LAKE AREA	16	256	633
4267691	2019-Jan-13	ELDC	HERONRY LAKE AREA	16	256	633
4267692	2019-Jan-13	ELDC	HERONRY LAKE AREA	14	224	554
4267694	2019-Jan-13	ELDC	HERONRY LAKE AREA	16	256	633
4267695	2019-Jan-13	ELDC	HERONRY LAKE AREA	16	256	633
4267698	2019-Jan-13	ELDC	HERONRY LAKE AREA	16	256	633
4267699	2019-Jan-13	ELDC	HERONRY LAKE AREA	16	256	633
4267700	2019-Jan-13	ELDC	HERONRY LAKE AREA	14	224	554
4273688	2019-Feb-12	Crystal Lake	KINGSFORD	12	192	474
4273667	2019-Jan-06	ELDC	MATHER	16	256	633
4273669	2019-Jan-06	ELDC	MATHER	4	64	158
4273681	2019-Mar-11	ELDC	MATHER	4	64	158
4273687	2019-Feb-12	ELDC	MATHER	8	128	316
4283559	2019-Feb-10	ELDC	MATHER	6	96	237
4273685	2019-Feb-12	ELDC	POTTS	8	128	316
4273686	2019-Feb-16	ELDC	POTTS	8	128	316
4273670	2019-Jan-11	ELDC	TAIT	2	32	79
4273671	2019-Jan-11	ELDC	TAIT	12	192	474
<b>27</b>	<b>TOTAL</b>			<b>264</b>	<b>4,224</b>	<b>10,438</b>

ELDC=Emerald Lake Development Corp.

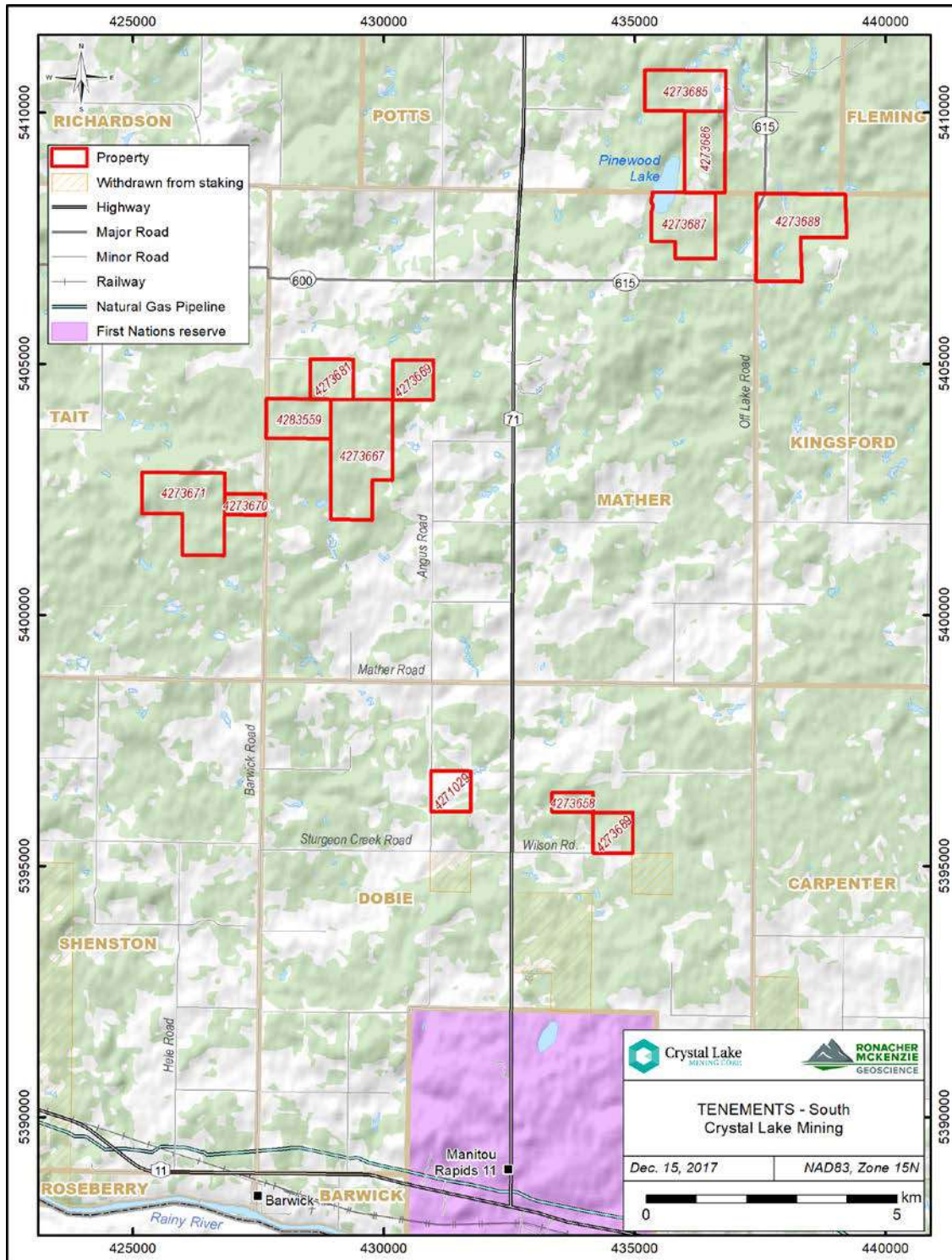


Figure 4-2: Map showing Crystal Lake's southern claim group.



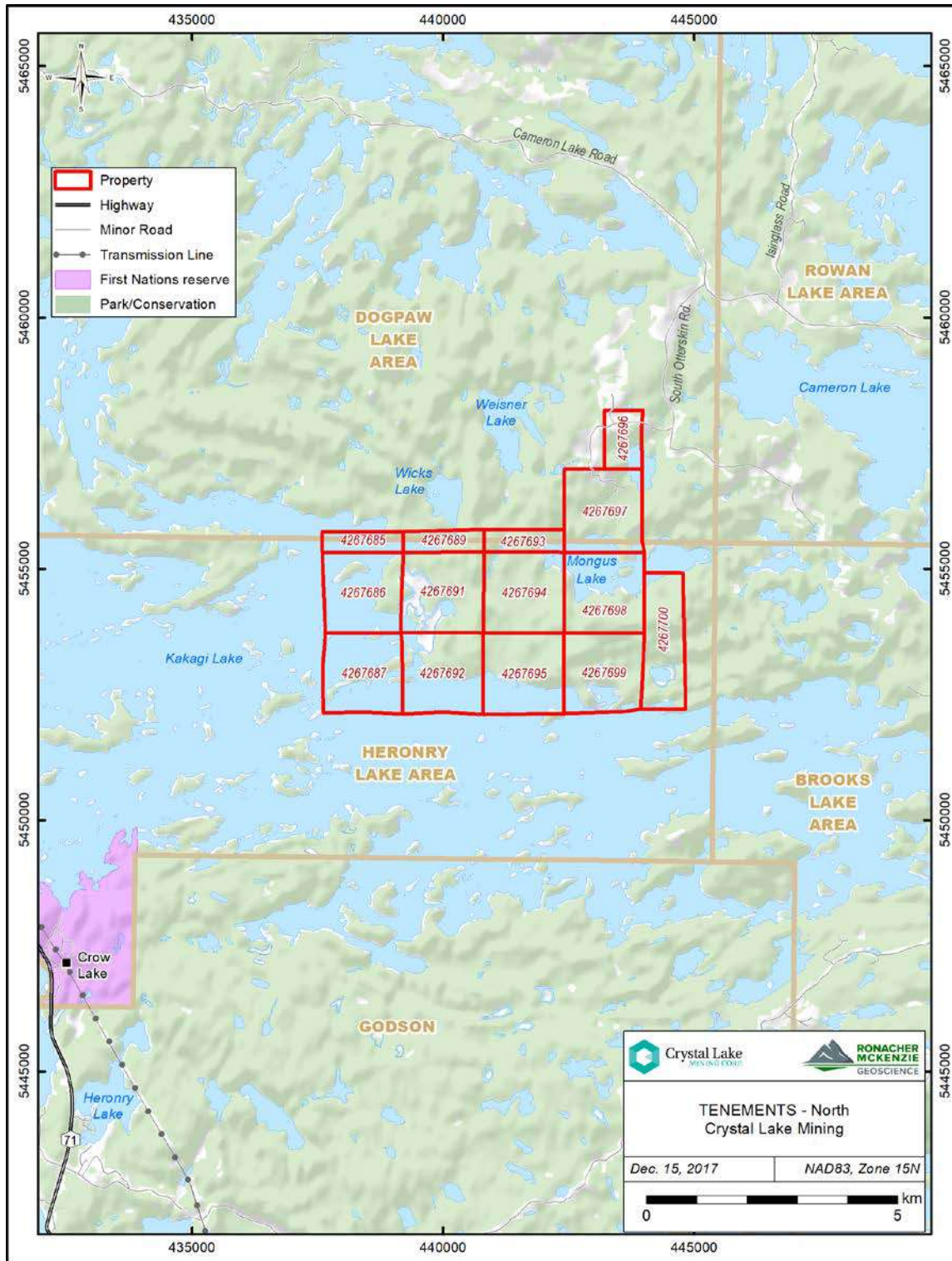


Figure 4-3: Map showing Crystal Lake's northern claim group.

## 4.2 Ownership

### 4.2.1 Claim 4271029

Claim 4271029 is also called Nico2 (previously termed EL5) property or Farm Claim. On May 26, 2015, Crystal Lake and Emerald Lake entered into an agreement where Emerald Lake granted Crystal Lake the right to earn up to 92% interest in the mineral claim 4271029. On February 13, 2017, Emerald Lake and Crystal Lake agreed for Crystal Lake to earn 100% interest in the mineral claim 4271029. On December 18, 2017, Emerald Lake and Crystal Lake agreed to replace and supersede all previous agreements regarding claim 4271029 with a new agreement dated December 18, 2017. According to this latest agreement, Crystal Lake has the option to increase Crystal Lake's interest in the claim and in two patents that Emerald Lake holds in the area and that are not a subject of this report to 60% by making a cash payment to Emerald Lake of \$2,000,000 in equal installments of \$500,000 each over two years with the initial payment to be made after the completion of a financing that exceeds \$2,000,000. Crystal Lake will also have the right to increase its interest in the claim and the patents by 25% to a total of 85% by paying \$8,000,000 in cash or common shares to Emerald Lake. In addition, Crystal Lake will have the right of first refusal to obtain the remaining 15% interest in the claim. The claim is subject to a 2% Net Smelter Return ("NSR"), of which Crystal Lake can buy back 1% for \$1,000,000 USD. During the option period, Crystal Lake is responsible for funding all expenditures on EL5. During the option period, Emerald Lake is the operator and is responsible for carrying out the work program.

The surface rights for the area covered by claim 4271029 are held by Crystal Lake.

### 4.2.2 Claims held by Emerald Lake

On September 27, 2016, Crystal Lake entered into an agreement with Emerald Lake whereby Emerald Lake granted Crystal Lake the first option and right of first refusal to acquire 100% interest in certain mineral claims, including claims that are the subject of this report (Table 4-2). In order for the right of first refusal to remain in good standing, Crystal Lake would pay to Emerald Lake an aggregate sum of \$50,000 by the earlier of the completion of the Crystal Lake's next equity financing aggregating \$150,000 or more, or April 30, 2017. The purchase price for each claim group is listed below and the property numbers are tabulated in Table 4-2.

- Property 1: 3,000,000 shares
- Property 2: 3,000,000 shares
- Property 5: 3,000,000 shares
- Property 6: 2,000,000 shares
- Property 7: 1,000,000 shares

- Property 8: 500,000 shares

On January 20, 2017, Crystal Lake exercised the option to purchase Property 6 (claim 4273688; Kingsford Township) from Emerald Lake for 2,000,000 common shares. The claim remains subject to a 3% NSR (Crystal Lake News Release, February 6, 2017).

On September 28, 2017, Crystal Lake chose to exercise the right of first refusal by purchasing the mineral rights to the remaining claims (properties 1, 2, 5, 7 and 8) and four additional claims listed in Table 4-3. The original agreement dated September 27, 2016 was amended to include a 2% NRS instead of the original 3% NSR. This transaction is subject to regulatory approval as of the effective date of this report.

The surface rights of these claims are not held by Crystal Lake.

*Table 4-2: List of claims that are part of the option and purchase agreement.*

Property	Claim Number	Township/Area
1	4276458	Dobie
2	4267686	Heronry Lake Area
2	4267687	Heronry Lake Area
2	4267691	Heronry Lake Area
2	4267692	Heronry Lake Area
2	4267694	Heronry Lake Area
2	4267695	Heronry Lake Area
2	4267698	Heronry Lake Area
2	4267699	Heronry Lake Area
2	4267700	Heronry Lake Area
2	4267685	Dogpaw Lake Area
2	4267689	Dogpaw Lake Area
2	4267693	Dogpaw Lake Area
2	4267696	Dogpaw Lake Area
2	4267697	Dogpaw Lake Area
5	4273685	Potts
5	4273686	Potts
5	4273687	Mather
6	4273688	Kingsford
7	4273670	Tait
7	4273671	Tait
8	4273689	Dobie

*Table 4-3: Additional claims included in the latest purchase agreement.*

Claim Number	Township/Area
4273667	Mather
4273669	Mather



Claim Number	Township/Area
4273681	Mather
4283559	Mather

The QP is not aware of any royalties, back-in rights, payments, or other agreements and encumbrances to which the property is subject, other than the ones mentioned above.

The QP is not aware of any environmental liabilities to which the property is subject.

The QP is not aware of any other significant factors or risks that may affect access, title or the right or ability to perform work on the property.

## 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

The claims are located in Dobie, Kingsford, Mather, Potts and Tait townships and Dogpaw Lake and Heronry Lake areas. Dobie Township is located approximately 40 km northwest of the Town of Fort Francis, Mather Township is ~50 km and Mather, Potts and Tait townships are ~60 km northwest of Fort Frances. The population of Fort Frances is 7,739 (Statistics Canada 2018). Emo is the closest settlement to the southern claim group. The population of Emo is 1,333 (statcan.gc.ca).

The claim group in Dogpaw Lake and Heronry Lake areas is located is located ~70 km north of Emo and ~80 km south of Kenora. The closest settlements are Sioux Narrows and Nestor Falls.

### 5.1 Access

Access to the claims is on provincial highways and roads (Figure 5-1, Figure 4-2, Figure 4-3). Claim 4271029 can be access from Emo, Ontario, on Highway 11 and Highway 71. Sturgeon Creek Road off Highway 71 and Angus Road lead directly to this claim.

Claims 4273689 and 4176458 are located 3 km east of claim 4271029 can are also accessed via Highway 11 and Highway 71 from Emo. Wilson Road off Highway 71 leads to these claims.

The claims in Tait and Mather townships (except claim 4273687) can be accessed via Mather Road and Barwick Road off Highway 71.

The claims in Potts and Kingsford townships and claim 4273687 are accessed on via Highway 615 off Highway 71.

The northern claim group in Dogpaw Lake and Heronry Lake areas is reached via Highway 71 and Cameron Lake Road off Highway 71. South Otterskin Road leads to the claim group from Cameron Lake Road.

The closest airport is located in Fort Frances.

## **5.2 Climate**

The climate in the property are is continental with long, cold winters and short warm summers. The warmest mean temperatures are typically recorded in July (~24° C) and the coldest temperatures in January (-15° C), however maximum temperatures can reach 30° C in June and July and -35° C in January and February (climate.weather.gc.ca). Maximum snow fall occurs in January (~25 cm) and maximum rainfall in June (~100 mm). Total annual precipitation is ~600 mm. Exploration can be completed year-round.

## **5.3 Physiography and Vegetation**

The area is characterized by very low relief with an average elevation of ~350-400 m above sea level (asl) for all claim groups. The northern claim group is characterized by numerous lakes.

The southern claim groups consist of farm land or forest with birch being the dominant type of tree. Overburden is locally up to 60 m thick. The northern claim group is forested with birch, spruce, pine and aspen. Here, the overburden is thinner, between 1 and 10 m, with local bedrock exposures.

## **5.4 Infrastructure and Local Resources**

Power exists in the area of the southern claim group. The main power line is located approximately 15 km west of the northern claim group. Water for exploration is available from streams and lakes. Mining personnel, skilled and unskilled labor are available due to recent exploration and mining activities in the area. A CN rail line runs parallel to Highway 11 connecting to Thunder Bay and Winnipeg.

Services such as stores, banks, gas stations and hotels are available in Fort Frances and Kenora.

The sufficiency of surface rights for mining operations, tailings storage areas, waste disposal areas, heap leach pad areas, and processing plant sites are not relevant to the project at this stage.

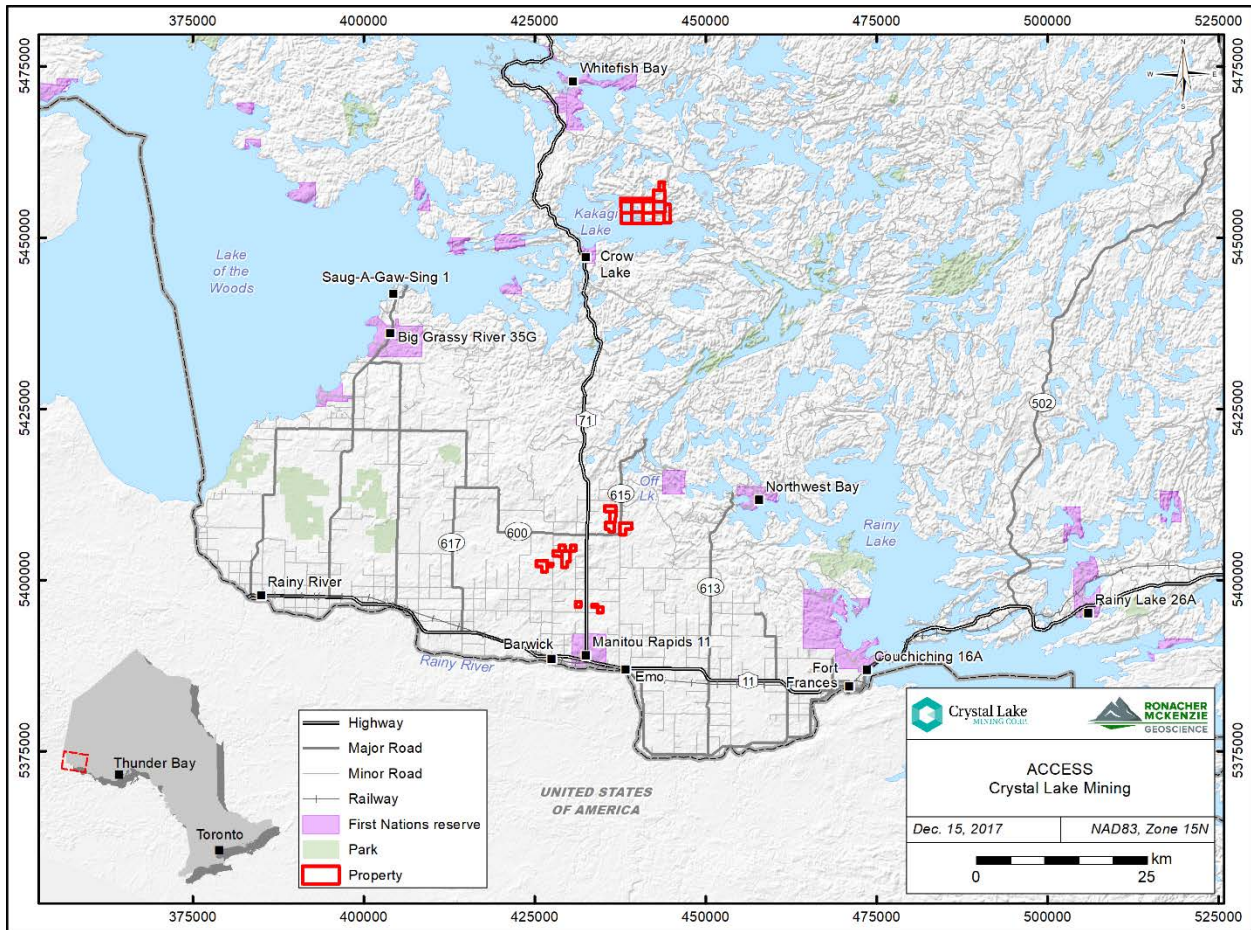


Figure 5-1: Access to the claims that are the subject of this report.

## 6.0 HISTORY

Fletcher and Irvine (1954) reported that the Rainy River area started receiving attention in terms of exploration in 1953 when base metal occurrences were found in southern Dobie Township. The historic exploration summarized below is from assessment reports that are publicly available from the MNDM. The QP did not have access to any historic information for the claims in Dobie Township. The claims are surrounded by patented ground for which no assessment reports exist.

### 6.1 Potts Township/northern Mather and Kingsford Townships

Table 6-1: Overview of historic work completed on Crystal Lake's claim in Potts, Kingsford and northern Mather townships.

Township	Year	Company	Exploration Type	Results	Source
Potts/northern Mather	1973	Canadian Nickel Co. Ltd	diamond drilling: 3 holes	up to 5% pyrite/pyrrhotite	Assessment report: 20007411

Township	Year	Company	Exploration Type	Results	Source
Potts/northern Mather	1988	Walter Cummings	descriptions of the 1973 Canadian Nickel Co. drill holes	Zn and Cu sulfides in gabbro	Assessment report: 52C13SW0003 (Ogden, 1988a)
Potts/northern Mather	1988	Walter Cummings	magnetometer, self-potential, biogeochemistry	southwest dipping magnetic high delineated	Assessment report: 52C13SW0002 (Ogden, 1988b)
Potts/northern Mather	1989	Walter Cummings	mag-EM	EM anomaly delineated, no coincident magnetic anomaly	Assessment report: 52C13SW0001 (Ogden, MacEachern and Paterson)
Potts/northern Mather/Kingsford	1995	Noranda	mag-HLEM; 23.45 line km	linear magnetic and EM anomaly delineated	Assessment report: 52C13SW0004 (Smith & Petrie, 1995a)
Potts/northern Mather	1997	Puskas & Allen	diamond drilling:	no assay results available; logs indicated up to 17% sulfide (pyrite; minor pyrrhotite, chalcopyrite)	Assessment report: 52C13SW2001
Potts/northern Mather	2007	Rainy River Resources	mapping	mostly volcanic rocks, some gabbro and pyroxenite mapped	Assessment report: 20003413 (Ayes and Tims, 2007)

### 6.1.1 Canadian Nickel Company (“Inco”) (1972-73)

The Canadian Nickel Company followed up on an airborne EM conductor (MacEachern and Paterson, 1989); no information is available about the airborne survey. Inco drilled two Winkie and one diamond drill holes in northern Mather Township at the border with Potts Township (Table 6-2; Assessment report 20007411).

### 6.1.2 Walter Cummings (1988-89)

No detailed descriptions or assay data are available in the Canadian Nickel Co. drill logs but Ogden (1988a) reports in Assessment Report 52C13SW0003 that zinc and copper sulfides “associated with gabbro” overlying felsic rocks were intersected in the holes. He provided descriptions of the drill holes for the 1973 drill holes (Table 6-2). In 1988, Ogden (1988b) completed a geophysical survey (magnetometer and self-potential) on the claims drilled by the Canadian Nickel Company 1973 (Assessment Report 52C13SW0002) to determine whether any geophysical anomalies related to

the sulfide mineralization in the historic drill holes could be delineated. Ogden (1988b) concluded that southwest dipping magnetic zones existed in the area. In addition to the geophysical surveys, poplar bark was analyzed for trace elements without success.

In 1989, Cummings commissioned a magnetic and electromagnetic survey on the property (Assessment Report 52C13SW0001: MacEachern and Paterson, 1989). A strong EM anomaly was delineated; however, the magnetic survey did not provide any conclusive results and no relationship between the magnetic signature and the EM anomalies was established.

Table 6-2: List of drill holes completed by Canadian Nickel Co. in 1972/73.

Hold ID	Year	Depth (ft)	Depth (m)	Azimuth	Dip	Comment
48577	1972	226	68.66	180	-50	Zn and Cu in upper portions in gabbro; 189 ft (56.61 m) of fine-grained rhyolitic tuff and quartz breccia with 25% pyrrhotite and blebs of pyrite/chalcopyrite/sphalerite; 20% massive sphalerite over 15 cm at 205 ft (62.48 m) up to 1% cpy and 5% po/py; gabbro, dacite
48578	1972	190	57.72	360	-45	granitic rocks and gabbro, up to 30% sulfide; bottom of the hole intersected amphibolite with scattered pyrite and magnetite
48595	1973	360	109.37	360	-45	

### 6.1.3 Noranda (1995)

Noranda completed a magnetic and horizontal loop EM survey on the same claims that were previously held by Inco and W. Cummings in northern Potts Township in 1994. Smith and Petrie (1995, Assessment Report 52C13SW0004) claimed that several untested airborne EM anomalies exist in the northern part of the claim group and north of the previously drill tested anomalies (Section 6.2.1). Noranda surveyed a total of 23.45 line km and delineated a north-south trending magnetic anomaly and an EM anomaly that is parallel to the western edge of the magnetic anomaly.

### 6.1.4 Puskas & Allen (1997)

Puskas and Allen drilled four diamond drill holes totalling 309.57 m on the same claims in 1997 (Assessment report: 52C13SW2001). No mafic or ultramafic rocks were intersected, however, the granitic and sedimentary rocks hosted pyrite, pyrrhotite, chalcopyrite and sphalerite (Table 6-3)

Table 6-3: List of drill holes completed by Puskas and Allen in 1997.

Hold ID	Year	Depth (ft)	Depth (m)	Azimuth	Dip	Comment
PW-01-97	1997	267	81.11	NE	-45	minor pyrite, pyrrhotite, chalcopyrite and sphalerite in granitoids
PW-02-97	1997	303	92.05	270	-50	minor pyrite in granitoids
PW-03-97	1997	303	92.05	90	-90	minor pyrite, pyrrhotite, chalcopyrite and sphalerite in granitoids
PW-04-97	1997	146	44.35	90	-50	minor pyrite, pyrrhotite, chalcopyrite and sphalerite in sedimentary rocks
<b>TOTAL</b>		<b>1019</b>	<b>309.57</b>			



### 6.1.5 Rainy River Resources (2007)

Rainy River Resources (“Rainy River”) mapped the area around Off Lake in Potts Township (Assessment Report 20003413: Ayres and Tims, 2007). Metagabbro and pyroxenite intrusions were mapped in a set of felsic dikes called the Off Lake felsic dike complex, in the volcanic sequence near Pinewood Lake and the Mather metasedimentary sequence. Ayres and Tims (2007) also mentioned the linear magnetic high west of Pinewood Lake where the 1972/73 Inco drill holes are located. These authors interpreted the “distinctive, irregular, aeromagnetic expression” in the Off Lake felsic dike complex to indicate that mafic-ultramafic “megablocks and large septa” exist in the subsurface and are covered by overburden.

## 6.2 Dogpaw Lake/Heronry Lake Areas

Exploration for gold started in the area around Dogpaw Lake and Heronry Lake in the late 19<sup>th</sup> century when the Kenora-Fort Frances area was a prominent gold mining camp in Ontario (cf. Assessment Report 5205SE2005: Stephensen, 2000). Base-metal exploration started in the 1950s. Publicly available information on the exploration in the area of Crystal Lake’s claims is listed in Table 6-4).

Table 6-4: Historic exploration in the area of Crystal Lake’s claim in Dogpaw Lake and Heronry Lake areas.

Year	Company	Exploration Type	Results	Source
1969	Inco	diamond drilling: 3 holes (1853 ft/564.97 m)	intersected gabbro and pyroxenite; no assay data available	Assessment report: 53F04NW0135
1984	Inco	mapping; magnetic, VLF and scintillometer surveys	no anomalies found	Assessment report: 53F04NW0126 (MacGibbon, 1984)
1975	Hudson Bay Exploration and Development Company Ltd.	horizontal loop EM survey	7 anomalies with strike lengths of 90 to 760 m delineated	Assessment report: 53F04NW0137: MacTavish, 1975
2000	Hornby Bay Exploration Ltd.	mapping, sampling	mapping delineated mafic and ultramafic intrusions	Assessment report: 52F05SE2005: Stephensen, 2000
2008	Western Warrior Resources	airborne magnetic survey	several anomalies delineated	Assessment report 20000824: Raoul, 2008

### 6.2.1 Inco (1969, 1984)

The earliest publicly available record of exploration on Crystal Lake’s claims in the Dogpaw Lake and Heronry Lake areas dates to 1969 when Inco drilled three diamond drill holes totalling 564.9 m on these claims (Assessment report 53F04NW0135). No assay data are available; the logs indicated that gabbro and pyroxenite were intersected. In 1984, Inco mapped the area and completed a

magnetic, VLF and scintillometer survey without delineating any anomalies (Assessment report 53F04NW0126: MacGibbon, 1984). Scattered magnetic highs were interpreted to be due to gabbro sills. The VLF was complicated by swamps and conductive overburden. The mapping showed that mafic-ultramafic rocks intruded felsic to intermediate volcanic rocks. The dominant mafic-ultramafic rocks recognized were coarse-grained and variably altered (calcite, chlorite) gabbro, medium-grained olivine gabbro and medium-grained peridotite. The gabbro is weakly to moderately foliated and locally contains quartz veins. The pyroxenite is massive. A north-south trending fault was also mapped.

#### *6.2.2 Hudson Bay Exploration and Development Company Ltd. (1975)*

The Hudson Bay Exploration and Development Company Ltd. (“Hudbay”) completed an airborne geophysical survey in the area in 1972. No details are available; the survey is mentioned in a report summarizing a follow-up ground horizontal loop EM survey (Assessment report: 53F04NW0137). Seven anomalies of various strike lengths from 90 to 760 m were delineated. The anomalies are located within the felsic metavolcanic rocks and at the contact of the metavolcanic rocks with intrusions (no details about the intrusions were provided).

#### *6.2.3 Hornby Bay Exploration Ltd. (2000)*

Hornby Bay Exploration Ltd. completed a mapping and sampling program on their claims near Kakagi Lake in 2000 (Assessment Report 52F05SE2005: Stephenson, 2000). The survey focused on the area west of Wicks Lake, which is located 1.5 km north of Crystal Lake’s claim 4267693. In this area, felsic and mafic intrusive rocks were emplaced into intermediate volcanic and metasedimentary rocks. The mafic intrusions, dominantly massive to weakly foliated, medium- to coarse-grained diorite and gabbro and strongly magnetic pyroxenite, trend southeast. Stephenson (2000) collected five samples; the highest assay results were 75 g/t Au, 282 ppb Pt, 136 ppb Pd, 12 ppm Ni, 2730 ppb Cu and 18.1 ppm Zn in a quartz vein with 5% sulfides in diorite.

Gabbroic intrusions were also mapped in the area of Cameron Lake, ~2 km northeast of Crystal Lake’s claim group.

#### *6.2.4 Western Warrior Resources (2008)*

Western Warrior Resources completed an airborne magnetic survey in the area between Kakagi Lake and Off Lake at a line spacing of 50 m (Assessment Report 2000824: Raoul, 2008). The survey identified several magnetic anomalies and ground truthing these anomalies was recommended.

## 7.0 GEOLOGICAL SETTING AND MINERALIZATION

### 7.1 Regional Geology

The claims are located in the Wabigoon subprovince (Superior Province) of the Canadian Shield (Figure 7-1; Blackburn et al., 1991) and in a wedge that forms the boundary between the southern Wabigoon and the Quetico subprovinces (Hendrickson 2016; Poulsen 2000). This wedge, called Rainy River Block by Hendrickson (2016) is bounded by the Quetico Fault in the north and by the Sein River and Vermillion Faults in the south. The Wabigoon subprovince consists of volcanic rocks with a central axis of plutonic rocks; the eastern and western domains of the Wabigoon subprovince exhibit different tectonic characteristics (Percival, et al. 2006). The western domain, where the property is located, is dominated by a range of volcanic rocks from tholeiitic to calc-alkalic that were deposited between 2.745 and 2.720 (Percival, et al. 2006). The plutonic rocks are synvolcanic and consist mainly of tonalite, diorite and gabbro. Younger meta-sedimentary rocks form narrow belts within the volcanic sequences.

The eastern Wabigoon domain consists of greenstone belts and granitic plutons.



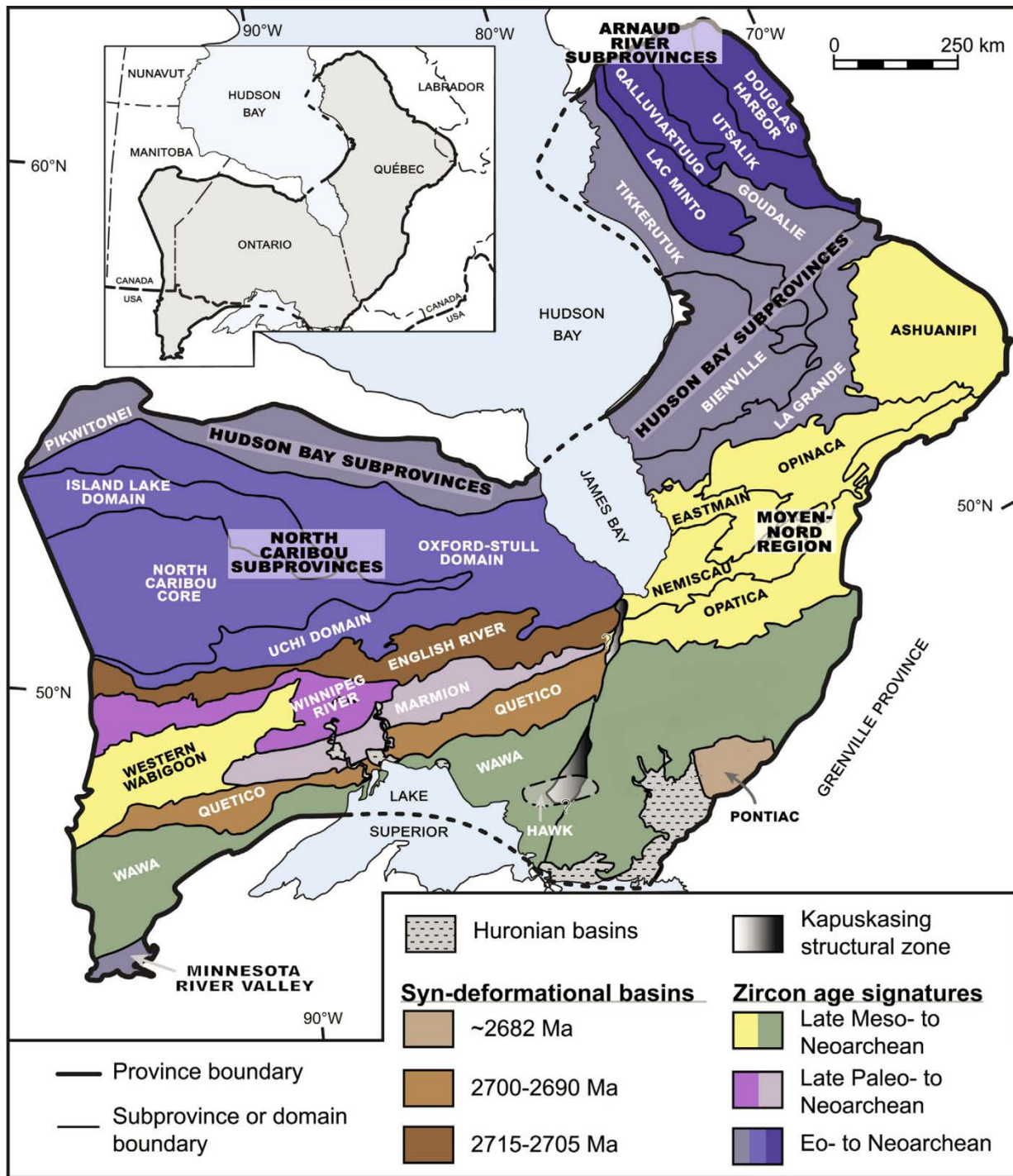


Figure 7-1: Location of the Wabigoon subprovince (modified from Frieman et al., 2017).

## 7.2 Local Geology

### 7.2.1 Southern Claim Groups

The bedrock geology of the southern claim group is dominated by thick sections of metasedimentary and metavolcanic rocks of the Keewatin Series. The sedimentary rocks are dominantly greywacke, iron formation and hornblenditic sedimentary rocks; the volcanic rocks range from felsic to intermediate to mafic (Fletcher and Irvine 1954). Granitic intrusions were emplaced into the sedimentary-volcanic sequence. Some mafic intrusives also occur in the area including norite and gabbro (Fletcher and Irvine 1954). Quartz diabase dikes cut all other rocks.

Fletcher and Irvine (1954) described two major folds in the area. One is located in Carpenter Township and extends west to Emo, with the fold axis trending northeast. The second fold axis trends in a similar northeast direction was mapped in Pinewood Lake and Potts townships.

Two mafic intrusions exist in the area: the Dobie intrusion and the Carpenter-Lash intrusion. The Dobie intrusion located in Dobie Township was defined based on aeromagnetic maps, some outcrop and drill core. The intrusion consists of medium-grained hypersthene gabbro and norite, coarse-grained pyroxenite and anorthosite (Fletcher and Irvine 1954). The feldspar content increases towards the contact with the volcanic rocks into which the intrusion was emplaced. Fletcher and Irwin (1954) noted the minerals appear fresh and unaltered and that the intrusion did not exhibit any gneissic texture; therefore, they concluded that the Dobie intrusion was not strongly metamorphosed or sheared.

The second mafic intrusion, the Carpenter-Lash Intrusion, is located ~10 km east of the Dobie Intrusion. It was also defined primarily by interpretation of airborne magnetic data. Contrary to the Dobie intrusion, which consists of several phases, the Carpenter-Lash intrusion is homogeneous consisting of labradorite (50-60%) and augite/hypersthene (Fletcher and Irvine 1954).

In addition to the Dobie and Carpenter-Lash intrusions, smaller bodies of mafic rocks are reported to exist in the area (Fletcher and Irvine 1954).

The area is covered by till, fluviolacustrine and lacustrine sand, silt and clay.

### 7.2.2 Northern Claim Group

The northern claim group is located in the Kakagi-Rowan lakes greenstone belt. Mafic and intermediate to felsic volcanic rocks are intruded by mafic to ultramafic sills. The volcanic and intrusive rocks were deformed and now form northeast trending, steeply dipping folds. Late granitic rocks intruded the sequence. Davies and Morin (1976) described the mafic and ultramafic rocks; they

concluded that these rocks occur either as (1) irregular pods of massive, medium- to coarse-grained gabbro that are “discordant to the local structure” in the mafic volcanic rocks, or (2) differentiated sills in the intermediate to felsic volcanic rocks. They distinguished five mafic to ultramafic sills in the area. The sills are described in Table 7-1

Table 7-1: Descriptions of the sills in the Dogpaw Lake Area (Davies and Morin 1976).

Sill #	Area	Thickness (m)	Description
1	south of Dogpaw Lake to Emma Bay and south of Peninsula Bay	760 m in east, 1,370 m in west	heterogeneous, ultramafic rocks at the base of the sill and in lenses in the gabbro; gabbro is coarse-grained
2	Cedar Lake to Peninsula Bay and west of Wicks Lake	305-760	very coarse-grained, massive gabbro, basal layer of pyroxenite (135 m thick)
3	east side of Cedartree lake and northwest of Wicks Lake	490-1,005	basal layer of peridotite (490 m), gabbro
4	west and south of Stephen Lake and south of Weisner Lake	60-150	medium-grained, massive gabbro
5	south of Stephen Lake	490	basal pyroxenite (60 m) followed by peridotite (60 m) and 360 m of gabbro

A major, northwest striking fault (Pipestone fault) is marked by intense shearing; the shear zone is tens of meters wide, strongly carbonatized and characterized by quartz veins.

### 7.3 Structure

The east-west trending Quetico fault is the most prominent structure in the area. The fault zone is over 200 km long (Blackburn et al., 1991), up to 1 km wide and includes evidence of strong shearing in the form of mylonites and pseudotachylites (Poulsen 2000); the most recent movement along the fault was dextral. It cuts across lithologic boundaries and is a major and long-lived crustal feature (Blackburn et al., 1991).



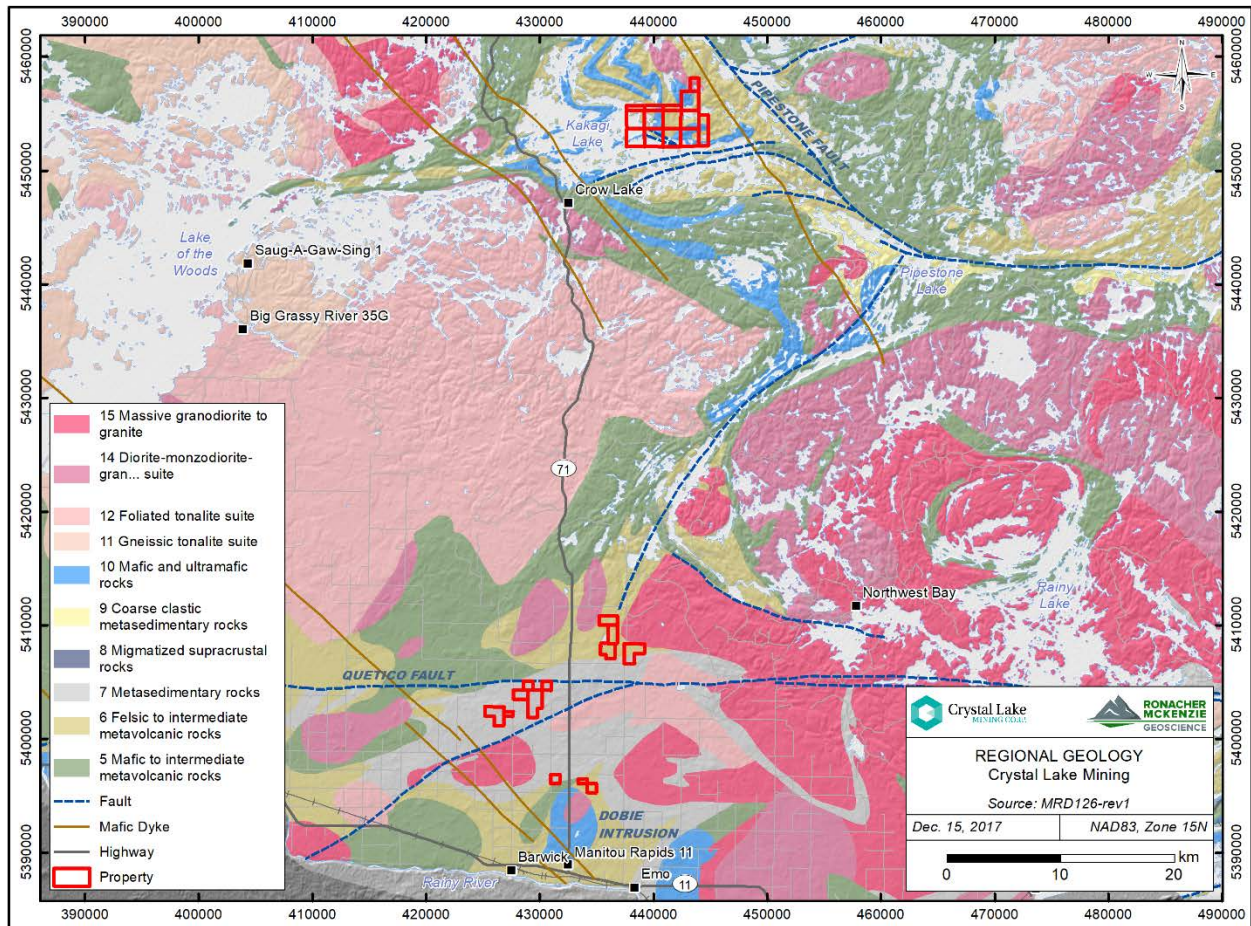


Figure 7-2: Local Geology

## 7.4 Property Geology

Outcrop is very sparse in the southern claim group. The area is covered by up to 60 m of glacial drift, with 25 to 35 m being the average thickness in the area between Emo and Lake of the Woods (Bajc 1991, 2001).

The descriptions below are based on OGS maps M1954 (Fletcher and Irvine 1954) and Ontario Geological Survey map M2443 (OGS, 1997).

### 7.4.1 Dobie Township Claims

The dominant rock types on the claims in Dobie Township are clastic sedimentary rocks (sandstone, siltstone, argillite) on claim 4271029 and felsic to intermediate volcanic rocks (tuff, agglomerate and breccia) on claims 4276458 and 4273689.

#### *7.4.2 Tait and Mather Township Claims*

The dominant rock types on the claims in Tait and Mather townships are also clastic sedimentary rocks, mainly pebble and boulder conglomerate and sandstone, siltstone and argillite. This claim group is located between the Quetico fault and a splay of the Quetico fault.

#### *7.4.3 Potts/Kingsford/northern Mather Township Claims*

The claim group in Potts, Kingsford and northern Mather townships fall within a sequence of felsic to intermediate metavolcanic rocks (tuff, agglomerate, breccia and flows) and a sliver of mafic metavolcanic rocks. Drilling by Inco in 1972/73 appeared to intersect mafic intrusive rocks (gabbro; Assessment Report 52C13SW0003: Ogden, 1988a) but no such rocks appear on M2443 (OGS 1997).

A northeast trending structure may extend from Off Lake ~7 km north of the claim group to Pinewood Lake, which is partly within the claim group.

#### *7.4.4 Dogpaw Lake Area/Heronry Lake Area Claims*

The dominant rocks in the northern claim group are gabbro and pyroxenite intruded in intermediate and felsic metavolcanic rocks (M2443: OGS, 19997). Local structures trend WNW.

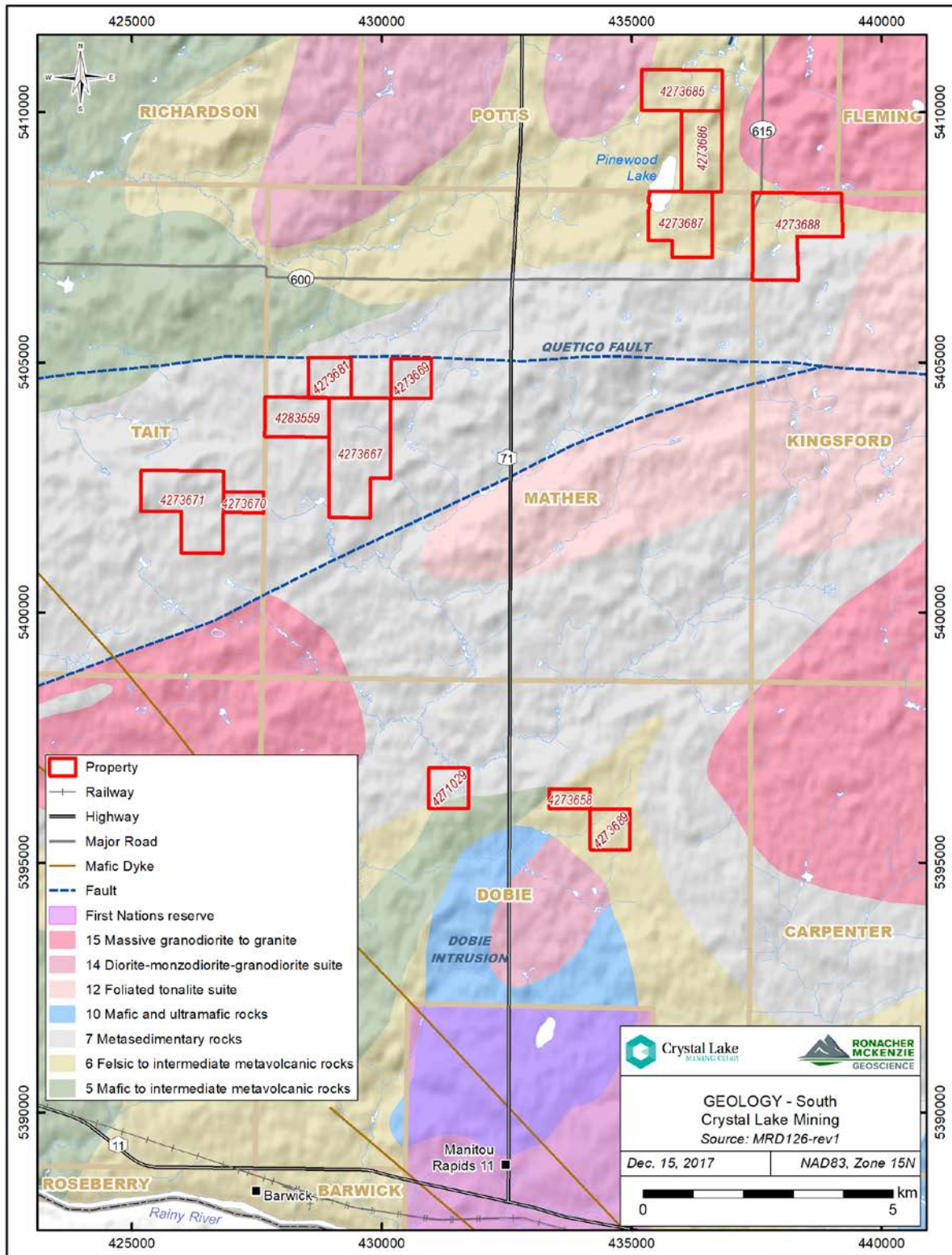


Figure 7-3: Geology of the southern claim group.



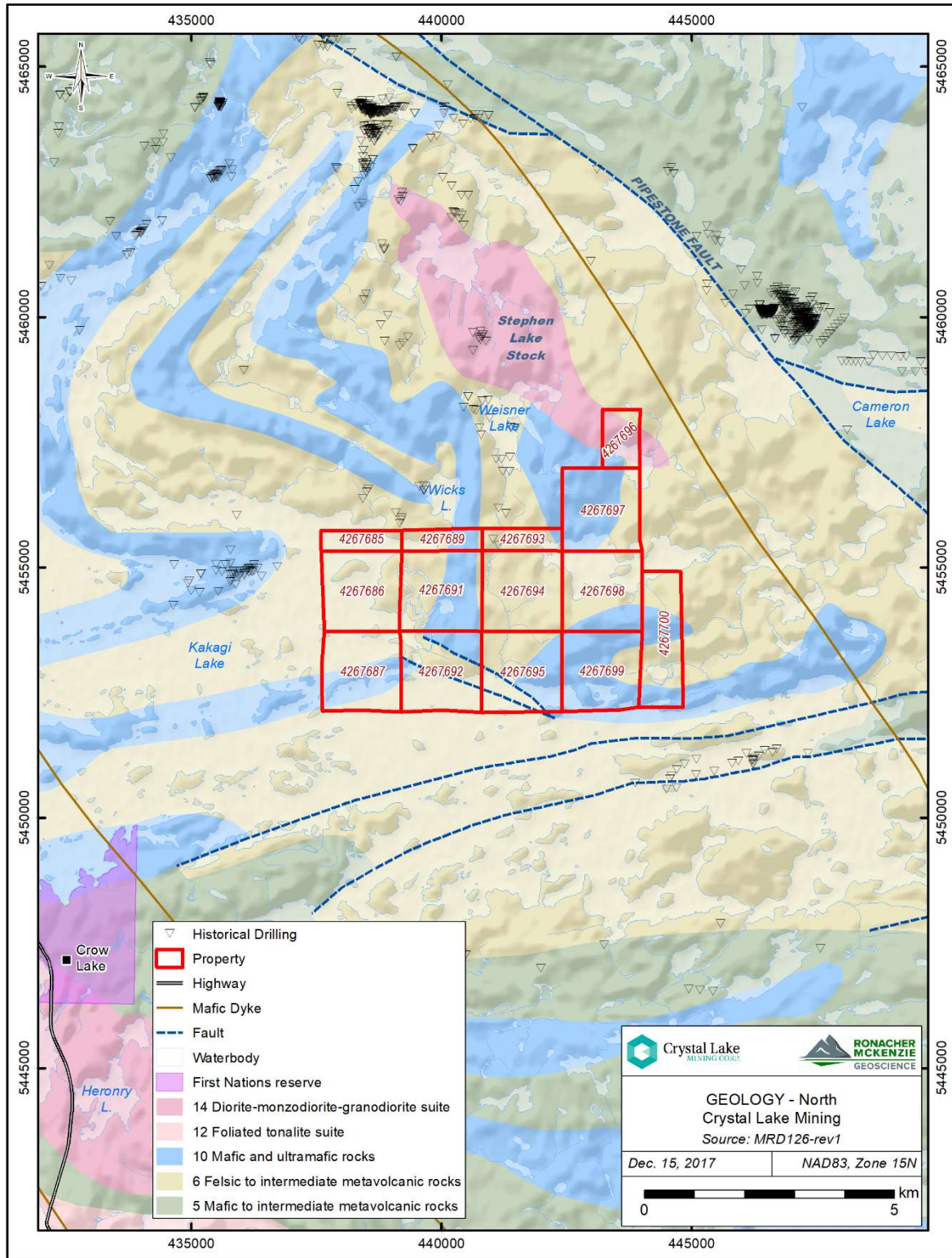


Figure 7-4: Geology of the northern claim group.

## 7.5 Mineralization

Mineralization has only been encountered on claim 4271029. The mineralization consists of semi-massive breccia sulfide veins and stringers in pyroxenite containing disseminated sulfides. The sulfide breccias contain sub-rounded 1-10 cm fragments of pyroxenite, and they form an anastomosing network within a larger domain of pyroxenite with disseminated sulfide mineralization. The sulfides comprise dominantly pyrrhotite (60-70%) with some pentlandite (10%) and minor chalcopyrite. The chalcopyrite is locally segregated and forms either remobilized veins or wraps around inclusions. The host rocks of the Dobie Intrusion are pyroxenites.

The geological controls, length, width, depth and continuity of the mineralization has not been determined to date.

Outside the Crystal Lake claims, Ni-Cu-PGE occurrences associated with mafic-ultramafic intrusions were documented by the OGS, including the Dobie Prospect, ~7 km south of claim 4271029.

## 8.0 DEPOSIT TYPES

Orthomagmatic Ni-Cu-PGE deposits are associated with mafic-ultramafic intrusions and occur in a variety of tectonic settings, such as continental rifts and large igneous provinces. The magma is mantle derived and has undergone a high degree of partial melting, which enriches the magma in Ni and PGE (Barnes and Lightfoot 2005). In order for a Ni-Cu-PGE deposit to form, the magma must ascend to crustal levels fast so that Ni is not incorporated into olivine during cooling. Once the magma has reached the crust, an external source of sulfur is required to form sulfide melt droplets. If these droplets interact with a large volume of magma they will scavenge metals to form a Ni-, Cu- and PGE-rich melt. This melt either segregates to the base of the intrusion because it is denser than the silicate melt, or it migrates into open spaces because it solidifies at lower temperatures (~900° C) than the silicate melt (~1000° C). The morphology of these open spaces is typically controlled by regional structures (Lightfoot and Evans-Lambwood 2015).

The geophysical expression of these deposit is in the form of a magnetic anomaly caused by the often magnetite-rich mafic and ultramafic rocks. The mineralization, specifically the massive portion, may cause an EM conductivity anomaly, depending on its size and geometry. The typical geophysical footprint of the deposits together with a favorable geological and structural setting can be the basis for an exploration program.



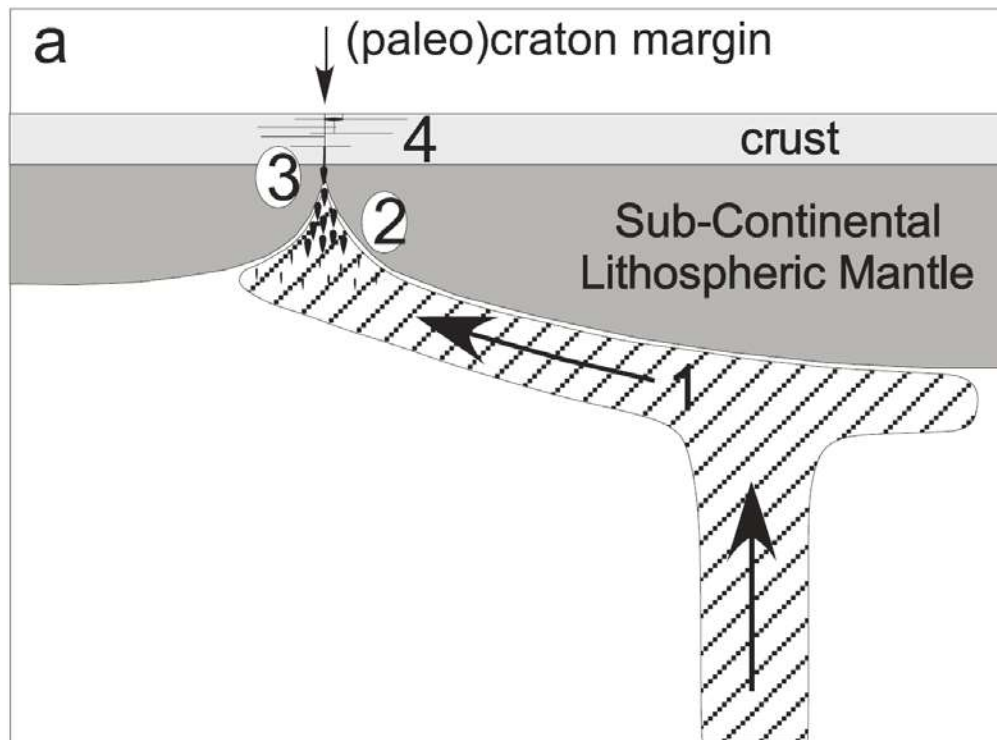


Figure 8-1: Schematic model for the formation of Ni-Cu-PGE deposits (from Begg, et al. 2010)  
 1 – melting and rising of mantle magma; 2 – decompression melting at shallow levels; 3 – melts migrating into upper crust; 4 – interaction of melt with crust, including sources of sulfur.

## 9.0 EXPLORATION

### 9.1 Ground Geophysics – Magnetic and VLF Survey

Emerald Lake commissioned Geosig Inc. (“Geosig”) to conduct a ground magnetic (“mag”) and very low frequency (“VLF”) survey on claim 4271029. The survey was run from August 20<sup>th</sup> – 25<sup>th</sup>, 2015 (Simoneau 2015).

The total magnetic field was collected using a GSM-19WMV magnetometer operated in “mobile mag” mode. Samples were collected every 25 ft (7.62 m). A GSM-19W magnetometer was used to measure the magnetic diurnal at the base station and was sampled every 15 s. The magnetic data was diurnally corrected during the data download process. A base datum value of 56,400 nT was removed from the dataset prior to data processing. The precision of the GSM-19 units is noted to be ± 0.1 nT (Simoneau 2015). A map of the ground magnetic results can be found in Figure 9-1.

The VLF survey was collected using the GSM-19WMV instrument. Readings were recorded every 25 ft (7.62 m). The survey utilized station NAA broadcasting at 24.0 kHz from Cutler, Maine and station NLK broadcasting at 24.8 kHz from Jim Creek, Seattle, Washington. The results of the VLF survey

were presented in profile format (Simoneau 2015). A map of the ground VLF profile results can be found in Figure 9-2. The figure denotes the 24.8 kHz results, with in-phase response displayed as red profiles, the quadrature response displayed as blue profiles and the total field response displayed as green profiles.

A total of 20 lines were surveyed east-west, using GPS. Each line was 1,320 ft (402.34 m) long and the line spacing was set to 100 ft (30.48 m). The overall survey consisted of 8.63 line-km and covered an area of 0.23 km<sup>2</sup>. Samples of both magnetic and VLF were recorded every 25 ft (7.62 m). This sample method and quality is considered representative of a typical mag and VLF survey. Apart from the powerline, no significant magnetic or electromagnetic features were noted.

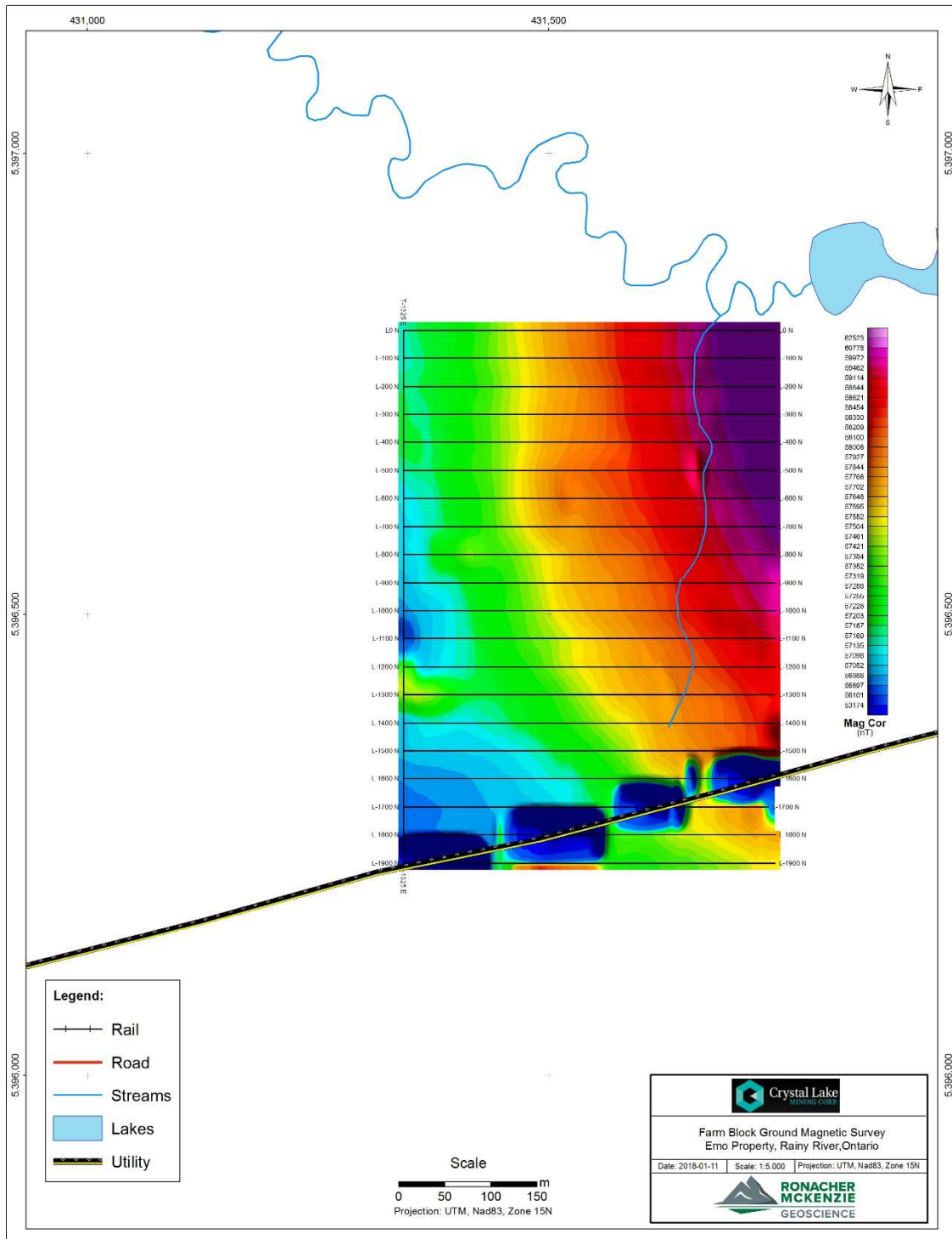


Figure 9-1. Results of the Farm ground magnetic survey

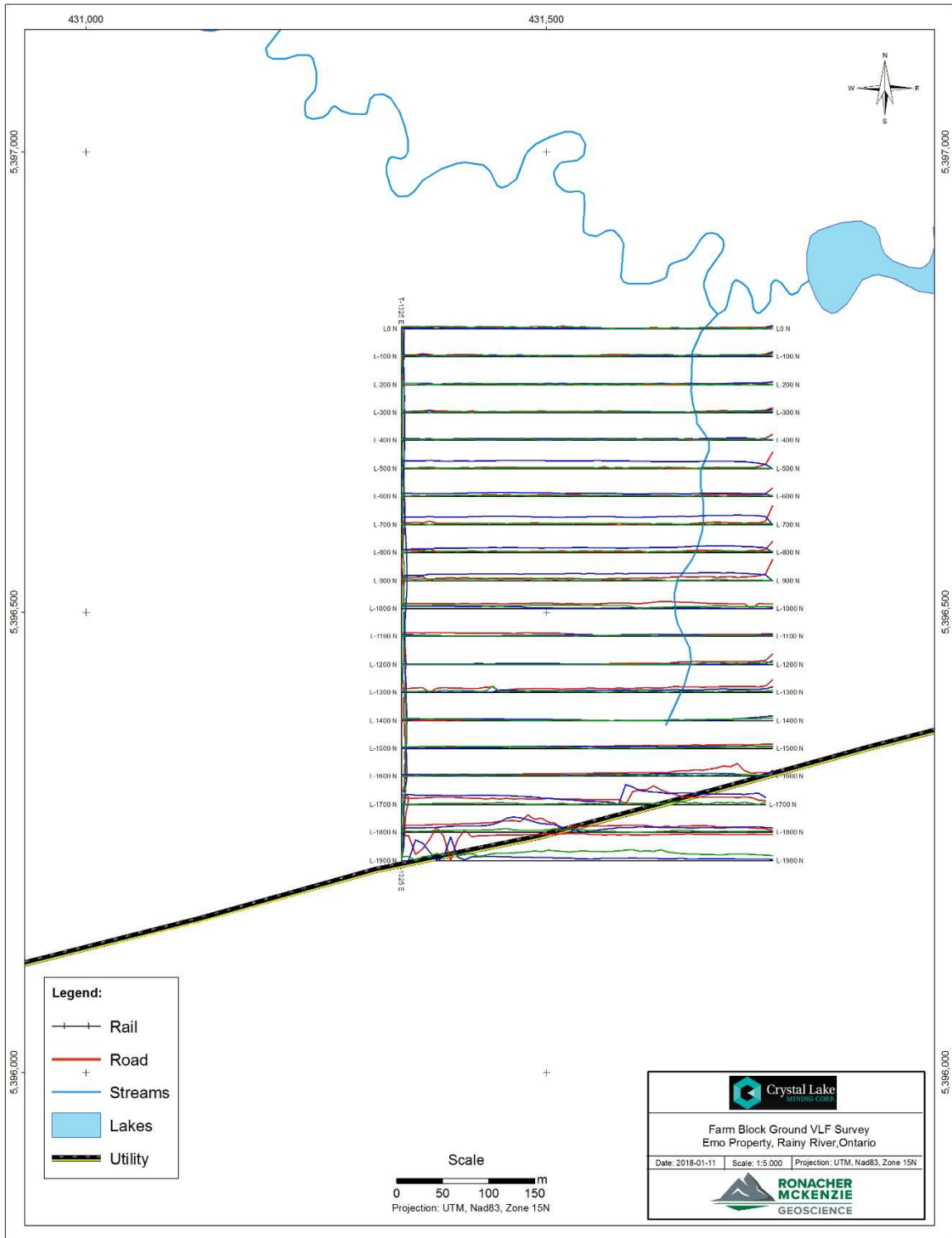


Figure 9-2. Results of the Farm ground VLF survey, 24.8 kHz. red = in phase, blue = quadrature, green = total field

## 10.0 DRILLING

Crystal Lake completed one diamond drill hole on claim 4271029 between September 26 and 28, 2015 (Figure 10-1). Drill hole details are listed in Table 10-1. The core diameter was NQ (47.6 mm) and the drilling contractor was Full Force drilling of Peachland, BC.

Table 10-1: Details of drill hole A-0-15 drilled on claim 4271029 in 2015.

Drill Hole ID	Easting*	Northing*	Azimuth (°)	Dip (°)	Final Length
A-0-15	431715	5396626	262	-45	91.44

\*NAD 83, Zone 15N

Drill hole collar locations were recorded with a hand-held GPS. Downhole deviation was recorded using a Reflex EZ-Shot instrument. However, this instrument is not suitable for determining downhole deviation in strongly magnetic rocks such as the ones on this property. No other details of drilling procedures were available to the QPs.

Mafic and ultramafic rocks with disseminated sulfides were logged. Disseminated, vein and globby sulfide was described in the drill logs; locally 10% sulfide content was recorded. A total of 12 samples were collected and submitted for assaying (Table 10-2).

Table 10-2: List of drill core samples collected from drill hole A-0-15 with assay results.

SAMPLE #	From (m)	To (m)	Interval (m)	Au (ppb)	Pd (ppb)	Pt (ppb)	Cu (%)	Ni (%)
187064	20.12	21.34	1.22	3	< 5	10	0.107	0.148
187065	21.34	22.86	1.52	10	< 5	< 5	0.107	0.100
187066	22.86	23.77	0.91	6	7	6	0.219	0.226
187067	23.77	24.69	0.91	8	6	< 5	0.253	0.157
187068	24.69	25.04	0.35	34	10	< 5	0.377	0.277
187069	26.00	26.18	0.18	14	21	13	0.150	0.146
187070	28.04	28.96	0.91	15	48	29	0.080	0.064
187071	30.94	31.09	0.15	32	27	14	0.356	0.172
187072	40.90	41.76	0.86	13	32	13	0.143	0.198
187073	44.20	44.62	0.42	48	19	11	0.218	0.547
187074	57.79	57.92	0.13	17	64	19	0.108	0.272
187075	57.92	58.83	0.91	7	20	8	0.042	0.050

The results indicate that low-grade Ni mineralization is present in the drill core.



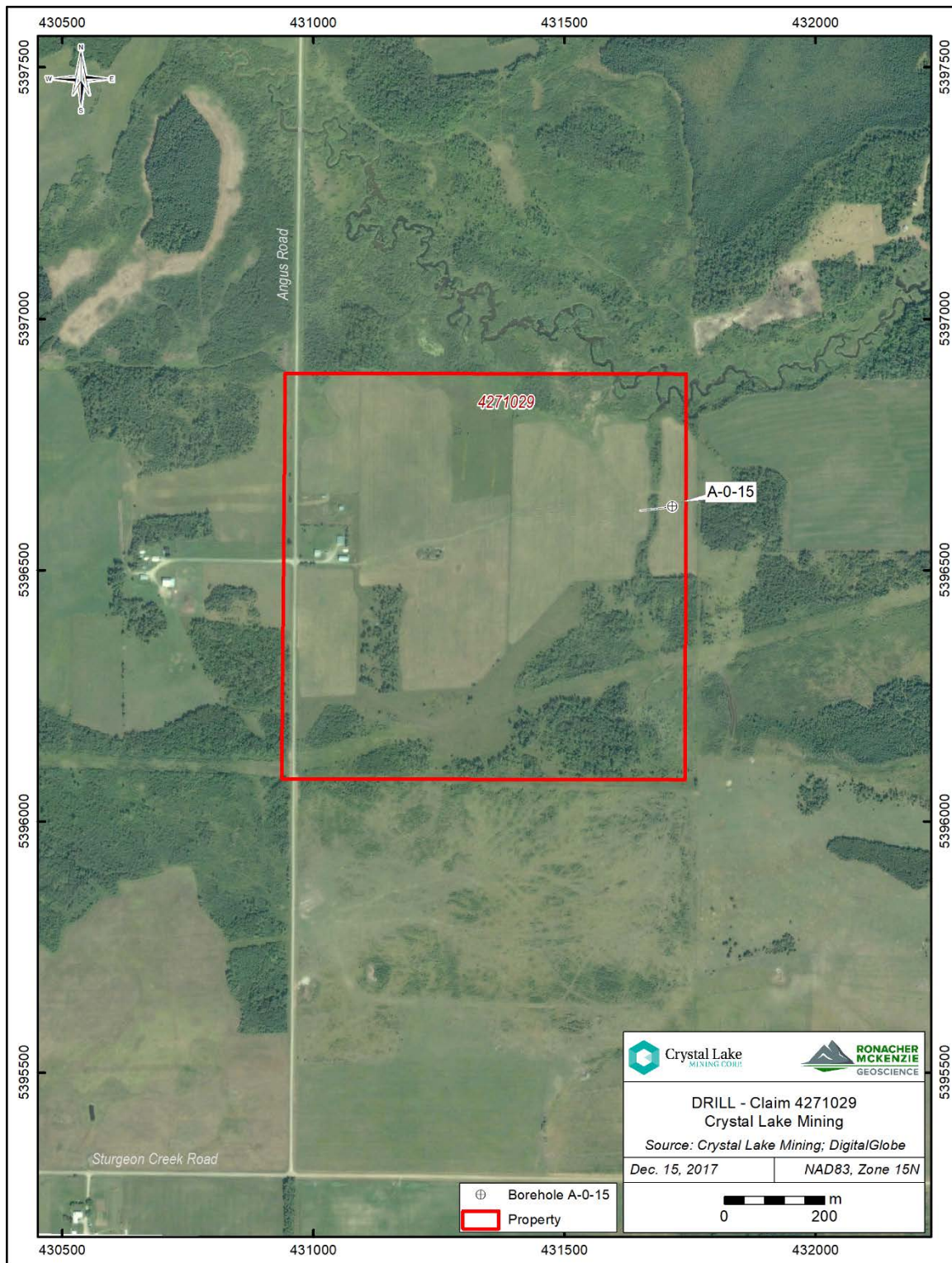


Figure 10-1: Location of diamond drill hole A-0-15 on the Nico2 prospect.

A petrographic examination of one sample from drill core A-0-15 at 25 m depth indicates an assemblage of pyrrhotite, chalcopyrite, and granular pentlandite in a strongly recrystallized amphibolite. Microprobe analyses completed at the University of Western Ontario using a Joel system was used to establish the compositions of pyrrhotite and pentlandite in a sub-sample from this sample. Pyrrhotite from this sample has a Ni abundance of <0.021 wt% and 1.14-1.91% Co. Analysis of granular pentlandite from the same polished thin section was undertaken and 37.2-39.2 wt% Ni in pentlandite and <0.2 wt% Co in pentlandite were recorded. Insufficient information about the orientation of the mineralization is known at this stage; the sample intervals do not reflect the true thickness of the mineralization. Some sample intervals are short and these samples may not be representative. The QPs did not determine any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results other than the ones mentioned above.

## 11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

The drilling company delivered the drill core to Crystal Lake's logging facility. Sample intervals were selected by Crystal Lake's logging geologist and the selected intervals were split using a core saw. Sample intervals range from 0.13 to 1.52 m. Samples were placed in plastic sample bags with pre-labeled sample tags. No external certified reference materials and blanks were inserted into the sample stream. No duplicates were included. Samples were stored in Crystal Lake's logging facility until they shipped to Activation Laboratories ("Actlabs") in Ancaster, Ontario, by courier. At Actlabs, the samples were crushed, and an aliquot was pulverized. The samples were then analyzed by fire assay with an ICP-OES finish for Au, Pd and Pt. Silver was analyzed by fire assay with a gravimetric finish. Copper, nickel and cobalt were analyzed by total digestion and OES.

Actlabs is accredited to international quality standards through the International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) 17025, which includes ISO 9001 and 9002. The accreditation includes fire assay analysis for Au as used by Crystal Lake. Actlabs is also accredited for Pt and Pd analysis by fire assay with an ICP finish. Crystal Lake chose a Pt and Pd fire assay analysis with OES finish.

There is no relationship between Actlabs and Crystal Lake other than that Crystal Lake commissioned Actlabs to complete the drill core sample analysis.

Crystal Lake did not have sufficient quality control procedures in place and did not take sufficient quality assurance actions. Any future drilling programs should follow the Best Practice Guidelines outlined by the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") and include standards, blanks and duplicates in the sample stream.

Sample preparation, security and analytical procedures were adequate. Quality control and assurance procedures were not adequate.

## 12.0 DATA VERIFICATION

### 12.1 Site Visit

Lightfoot and Ronacher visited the property from June 6 to 8, 2017. The site visit focused on claim 4271029, the only part of the property where Crystal Lake has completed exploration work. Lightfoot and Ronacher reviewed the drill core from hole A-0-15 and visited the drill hole collar location. Lightfoot also visited the property on October 20, 2017. He collected drill core samples from hole A-0-15 (Table 12-1). The samples were not collected from the same intervals that were sampled originally because the original intervals were deemed to be exceedingly short and not representative. The purpose of the current sampling was to determine whether mineralization exists in drill hole A-0-15, whether the grades of the mineralized zones are generally comparable, and what variations in Ni tenor of 100% sulfide could be established with more complete analytical data for S. The assay results are similar to the original assay results taking into account the more realistic lengths of the current samples.

Table 12-1: Assay results of drill core samples collected during the personal inspection.

Sample number	From (m)	To (m)	Interval (m)	S (%)	Au (ppb)	Pt (ppb)	Pd (ppb)	Co (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)
187255	25.04	26.00	0.96	2.030	5	<10	14	184.0	470	1130	1800
187256	26.18	28.04	1.86	0.956	15	20	33	129.0	1550	975	997
187257	28.96	30.00	1.04	0.812	13	20	38	134.0	1550	562	936
187258	30.00	30.94	0.94	0.625	13	20	36	110.0	1780	421	758
187259	31.09	32.00	0.91	0.134	3	20	39	80.7	1900	136	357
187260	39.90	40.90	1.00	0.373	10	20	45	91.7	1840	304	655
187261	38.90	39.90	1.00	0.131	10	20	39	75.3	1880	196	432
187262	37.90	38.90	1.00	0.876	18	20	37	124.0	1970	1040	1120
187263	36.90	37.90	1.00	0.323	18	20	47	90.6	2020	414	634
187264	35.90	36.90	1.00	1.050	9	10	32	130.0	1770	806	1220
187265	34.90	35.90	1.00	0.710	18	20	42	113.0	1910	792	964
187266	41.76	43.50	1.74	0.452	13	20	45	102.0	2010	463	829
187267	44.62	45.62	1.00	1.170	23	20	43	130.0	2030	1530	1670
187268	9.14	10.36	1.22	0.167	<1	<10	<1	58.5	128	53	88
187269	15.70	17.07	1.37	0.130	<1	<10	<1	50.0	63	48	75
187270	19.14	20.09	0.94	0.132	<1	<10	<1	53.0	94	50	80
187271	79.92	80.92	1.01	0.082	19	30	55	68.1	2250	145	454
187272	85.83	86.87	1.04	0.078	18	30	55	68.2	2230	163	476
187273	89.92	90.83	0.91	0.073	14	30	58	68.1	2300	161	484
187274	45.51	47.64	2.13	1.300	26	30	53	130.0	2060	2160	1880



Sample number	From (m)	To (m)	Interval (m)	S (%)	Au (ppb)	Pt (ppb)	Pd (ppb)	Co (ppm)	Cr (ppm)	Cu (ppm)	Ni (ppm)
187275	61.60	63.12	1.52	0.325	13	30	47	78.8	2090	630	721
187276	67.06	68.06	1.00	0.079	12	20	47	68.2	2270	145	460

## 12.2 Quality Control Analysis

Crystal Lake did not include standards, blanks and duplicates. Internal standards, blanks and duplicates were inserted by Actlabs. A total 41 method blanks were analyzed during the analyses for the various elements (Table 12-2). No information is available on what the blank material was and where in the sample sequence the blanks were inserted. There were no blank failures.

Table 12-2: List of blanks inserted by Actlabs.

Element Analyzed	No of Blanks inserted	No of Failed Blanks
Ag	16	0
Au	1	0
Au, Ag	1	0
Au, Pd, Pt	15	0
Cu, Ni, Co	7	0
<b>Total</b>	<b>40</b>	<b>0</b>

A total of 42 standards were inserted by Actlabs (Table 12-3). It is not known in what sequence the standards were analyzed. Two standards fell outside the certified value  $\pm 3$  standard deviations and thus failed.

Table 12-3: List of standards inserted by Actlabs.

Standard Name	Commodities	No of Standards Inserted	Standards Failed
PTM-1	Cu, Ni	2	1
CCU-1C	Cu	1	1
MP-1b	Cu	1	0
CZN-4	Cu, Co	2	0
CDN-GS-5H	Ag	9	0
OxK110	Au	1	0
CDN-PGMS-24	Au, Pd, Pt	8	0
CDN-PGMS-25	Au, Pd, Pt	6	0
CDN-GS-5P	Au, Ag	9	0
OXN117	Au	1	0
PTC-1b	Cu, Ni, Co	2	0
<b>TOTAL</b>		<b>42</b>	<b>2</b>

The data are adequate for the purpose of this report as they reproduce original assays, indicate a range in MgO contents of 8.7-17.7 wt% based on a sodium peroxide fusion decomposition and ICP-MS analysis) and provide basic information on sulfide Ni tenors (3.3-5.5 wt% Ni for samples with >0.75%S, assuming a standard assemblage of pyrrhotite, pentlandite, and chalcopyrite, with no correction for silicate Ni content); however, any future drilling program should include external standards, blanks and duplicates.

### **12.3 Ground Mag-VLF Survey**

The ground geophysics data was provided in digital format and was reviewed in the geophysical software package Geosoft Oasismontaj. The GPS location information was reviewed against the GIS compilation and determined to be in the correct location. The magnetic data was imported and gridded as well as inspected in profile format. Grids and profiles for both the 24.0 kHz and 24.8 kHz datasets (in-phase, quadrature and total field) were also inspected.

It is the opinion of Jenna McKenzie, P.Geo. and Qualified Person of this report that the magnetic and VLF dataset is adequate for the purposes used in this technical report.

## **13.0 MINERAL PROCESSING AND METALLURGICAL TESTING**

Crystal Lake has not completed any mineral processing and metallurgical testing.

## **14.0 MINERAL RESOURCE ESTIMATES**

Crystal Lake has not completed any resource estimates on the property.

## **15.0 ADJACENT PROPERTIES**

The southern claim group is surrounded by patented ground for which no exploration information was available.

The northern claim group is surrounded by unpatented mineral claims held by First Mining Finance Corp. ("First Mining") and their joint venture partners. First Mining's explores for gold hosted by orogenic deposits on these claims; the property is called Cameron Gold Project (Drabble and Cervoj 2017). The gold on this property is associated with pyrite and hosted by shear zones. Drabble and Cervoj (2017) estimated a measured and indicated mineral resource on the property of 3.49 Mt of

ore at a grade of 2.45 g/t Au in an open-pit setting and measured and indicated mineral resource of 2.04 Mt of ore at a grade of 2.9 g/t Au amenable to underground mining.

The qualified persons have been unable to verify the information and the information is not necessarily indicative of the mineralization on the property that is the subject of this report. The information quoted from the adjacent property is distinct from the information presented on the property that is the subject of this report.

## 16.0 OTHER RELEVANT DATA AND INFORMATION

The Qualified Persons are not aware of any other relevant data, information or explanation that would make this report understandable or not misleading.

## 17.0 INTERPRETATION AND CONCLUSIONS

Crystal Lake's Nicobat property consists of 27 non-contiguous unpatented mineral claims totalling 4,224 ha near Emo and Sioux Narrows, Ontario. The area is characterized by metavolcanic and metasedimentary rocks that were intruded by granitic and mafic-ultramafic intrusions. The mafic-ultramafic intrusions and magnetic anomalies that may correspond to hidden mafic-ultramafic intrusions are Crystal Lake's targets for exploration. The objective is to locate a significant new discovery of magmatic-textured Ni-Cu-Co sulfide mineralization.

Historic exploration on the Emo property consisted of mapping, sampling, ground magnetic and EM surveys and limited drilling. Mafic-ultramafic rocks and magnetic and EM anomalies were delineated but no significant Ni-Cu-PGE mineralization has been found to date.

In 2015, Crystal Lake completed a mag-VLF survey and one diamond drill hole on claim 4271029; no exploration was completed on the other claims. A total of 8.63 line-km of ground magnetic and VLF data was collected at 25 ft (7.62 m) station spacing and 100 ft (30.48 m) line spacing, covering 0.23 km<sup>2</sup>. No significant magnetic or electromagnetic signatures were noted on the survey apart from that of the powerline. Drill hole A-04-15 intersected gabbro and locally up to 20% sulfide. Twelve drill core samples were collected; the samples returned Ni values of up to 0.229 % Ni over 0.91 m and 0.547% Ni and 0.218% Cu over 0.42 m.

No certified reference materials or blanks were inserted into the sample stream; however, drill core samples collected during the personal inspection returned similar assay results as the original samples.

The QPs are not aware of any significant risks or uncertainties that could reasonably be expected to affect the reliability or confidence in the exploration information. No economic outcomes are projected from the data at this early stage of exploration. There are no reasonably foreseeable impacts associated with the omission of standards and blanks and the failure to use an appropriate downhole survey tool given the early stage of exploration.

Based on the geological setting of the area, the historic exploration and Crystal Lake's limited exploration on the Nicobat properties, the Lightfoot and Ronacher conclude that potential to find Ni-Cu-PGE sulfide mineralization on the properties exists.

## 18.0 RECOMMENDATIONS

Crystal Lake has completed a limited amount of exploration on the properties comprising the Nicobat Project. Based on the geological setting and the target type, the QPs recommend a staged exploration program.

### 18.1 Recommended Phase 1 Program – Geophysical Survey

Given the early stage of exploration on the Nicobat properties, the QPs recommend an airborne magnetic and electromagnetic survey ("mag-EM") on the various claim blocks. The purpose of the survey is to delineate magnetic and coincident EM anomalies. We recommend inverting the geophysical data containing significant anomalies in order to better understand the geometry of the target and surface geophysical surveys and drill holes that would appropriately test the anomalies.

Table 18-1: Cost estimate of the recommended Phase 1 exploration program.

Item	Unit	No of Units	Cost/Unit	Total Cost
Airborne Magnetic/EM Survey	line km	750	\$200	\$150,000
Mobilization/demobilization	Each	2	\$15,000	\$30,000
Interpretation of airborne data	hour	40	\$140	\$5,600
Reporting	hour	24	\$140	\$3,360
<b>TOTAL</b>				<b>\$193,440</b>

### 18.2 Recommended Phase 2 Program – Drilling Program

It is recommended that significant magnetic and EM anomalies delineated during the Phase 1 ground geophysical survey be drill tested to determine whether the geophysical anomalies are caused by Ni-Cu-PGE sulfide mineralization. It is strongly recommended that appropriate, carefully constructed and thorough QA/QC program be implemented during the drilling program to maintain chain of custody and quality control on every aspect of the work to comply with best practices. A downhole

deviation survey tool that is unaffected by magnetic interference from highly magnetic rocks should be used. The drilling program would be a reconnaissance program, and is not designed to test any single target at this point in time. An estimate of the anticipated cost is provided in Table 18-2.

Phase 2 exploration is contingent on the outcome of the Phase 1 program.

*Table 18-2: Cost estimate of the recommended Phase 2 exploration program.*

<b>Item</b>	<b>Unit</b>	<b>No of Units</b>	<b>Cost/Unit</b>	<b>Total Cost</b>
Drilling	m	2,800	\$100	\$280,000
Drilling program execution (geologist, vehicle, accommodation, meals, etc.)				\$80,000
Assaying	sample	1,500	\$40	\$60,000
Reporting	hour	80	\$130	\$10,400
<b>TOTAL</b>				<b>\$430,400</b>

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## 20.0 STATEMENT OF AUTHORSHIP

This report, titled “Independent Technical Report – Emo Project, Rainy River Area, Ontario”, dated February 5, 2018, and prepared for Crystal Lake Mining Corp., was completed and signed by the following authors:

“Signed and sealed”

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Peter Lightfoot, PhD, P.Geol.  
February 5, 2018  
Sudbury, ON

“Signed and sealed”

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Elisabeth Ronacher, PhD, P.Geol.  
February 5, 2018  
Sudbury, ON

“Signed and sealed”

---

Jenna McKenzie, P.Geol.  
February 5, 2018  
Toronto, ON

## Appendix 1 – Certificates of Qualified Persons

## CERTIFICATE OF QUALIFICATIONS

**Peter Lightfoot**  
**Lightfoot Geoscience**  
**Sudbury, ON, Canada**  
[peter@lightfootgeoscience.ca](mailto:peter@lightfootgeoscience.ca)  
☎ 249-360-1559

I, Peter Lightfoot, do hereby certify that:

1. I am the President and Chief Geologist for Lightfoot Geoscience Inc.
2. I am responsible for Sections 7 (Geological Setting and Mineralization), 12.1 (Site Visit), 12.2 (Quality Control Analysis), 17 (Interpretations and Conclusions) and 18 (Recommendations) of the report titled “Independent Technical Report – Project, Location” dated February 5, 2018, and prepared for Crystal Lake Mining Corp.
3. I hold the following academic qualifications: B.A. Geology (1980), University of Oxford, U.K., M.Sc. Geology (1982), University of Toronto, Toronto, Canada; Ph.D. Geochemistry (1985), Open University, Milton Keynes, UK.
4. I am a member in good standing of the Association of Professional Geologists of Ontario (APGO, member # 671), Fellow of the Geological Association of Canada (#F5424) and Hutchinson Visiting Industry Professor at the University of Western Ontario, London, Ontario (2017-2018).
5. I have worked on exploration projects worldwide (including Australia, China, Mongolia, India, South Africa, Angola, Morocco, Zambia, Finland, Greenland, Canada, USA, Brazil) and on Ni-Cu-Co sulfide properties and ore deposits, PGE deposits, and Ni-Ci laterite projects since 1997.
6. I have read the definition of “Qualified Person” set out in the National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional organization (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “Qualified Person” for the purposes of NI 43-101.
7. I visited the property from June 6-9, 2017 and October 20, 2017.
8. I am independent of the issuer as described in section 1.5 of the National Instrument 43-101.
9. I have no prior involvement with the property that is subject of this report.
10. I have read the National Instrument 43-101 this report has been prepared in compliance with this Instrument.
11. That, as of the date of this technical report, to the best of my knowledge, information, and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 28<sup>th</sup> Day of February, 2018

“Signed and Sealed”

---

Peter Lightfoot, Ph.D., P.Geo.  
Lightfoot Geoscience Inc.

## CERTIFICATE OF QUALIFICATIONS

Elisabeth Ronacher  
Ronacher McKenzie Geoscience  
935 Ramsey Lake Road  
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Mailstop: CEMI  
Sudbury, ON, Canada  
[elisabeth.ronacher@rmgeoscience.com](mailto:elisabeth.ronacher@rmgeoscience.com)  
☎ 705-419-1508

I, Elisabeth Ronacher, do hereby certify that:

1. I am the Principal Geologist at Ronacher McKenzie Geoscience Inc.
2. I am responsible for all Sections of the report titled “Independent Technical Report – Emo Project, Rainy River Area, Ontario” dated February 5, 2018 and prepared for Crystal Lake Mining Corp., except Sections 9 and 12.3.
3. I hold the following academic qualifications: M.Sc. Geology (1997), University of Vienna, Vienna, Austria; Ph.D. Geology (2002), University of Alberta, Edmonton, Canada.
4. I am a member in good standing of the Association of Professional Geologists of Ontario (APGO, member # 1476), the Society of Economic Geologists (SEG) and the Society for Geology Applied to Mineral Deposits (SGA).
5. I have worked on exploration projects worldwide (including Canada, Mongolia, China, Austria) and on a variety of commodities including Au, Cu, base-metal, Cu-Ni PGE and U deposits since 1997.
6. I have read the definition of “Qualified Person” set out in the National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a “Qualified Person” for the purposes of NI 43-101.
7. I visited the property on from June 6-8, 2017.
8. I am independent of the issuer as described in section 1.5 of the National Instrument 43-101. I am also independent of the vendors.
9. I have no prior involvement with the property that is subject of this report.
10. I have read the National Instrument 43-101 and this report has been prepared in compliance with this Instrument.
11. That, as of the date of this technical report, to the best of my knowledge, information, and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 28<sup>th</sup> Day of February, 2018

“Signed and Sealed”

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Elisabeth Ronacher, Ph.D., P.Geo.  
Ronacher McKenzie Geoscience

## CERTIFICATE OF QUALIFICATIONS

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Mailstop: CEMI  
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☎ 647-378-2648

I, Jenna McKenzie, do hereby certify that:

1. I am the Principal Geophysicist at Ronacher McKenzie Geoscience Inc.
2. I am responsible for Section 9 – Exploration and Section 12.3 – Data Verification: Ground Mag-VLF Survey of the report titled “Independent Technical Report – Emo Project, Rainy River Area, Ontario” dated February 5, 2018, and prepared for Crystal Lake Mining Corp.
3. I hold the following academic qualifications: Hons.B.Sc. Applied Physics - Geophysics (2002), University of Toronto, Toronto, Ontario.
4. I am a member in good standing of the Association of Professional Geologists of Ontario (APGO, member # 1653), the Society of Exploration Geophysicists (SEG) and the Canadian Exploration Geophysical Society.
5. I have worked on exploration projects worldwide (including Canada, USA, Mexico, Dominican Republic, Angola, Democratic Republic of Congo, Zambia, Republic of South Africa, Russia, Turkey and Indonesia). I have worked on porphyry-copper, gold, diamond, Ni-Cu-PGE, potash and rare-element pegmatites deposits since 2001.
6. I have read the definition of “Qualified Person” set out in the National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a “Qualified Person” for the purposes of NI 43-101.
7. I have not visited the property.
8. I am independent of the issuer as described in section 1.5 of the National Instrument 43-101. I am also independent of the vendors.
9. I have no prior involvement with the property that is subject of this report.
10. I have read the National Instrument 43-101 and this report has been prepared in compliance with this Instrument.
11. That, as of the date of this technical report, to the best of my knowledge, information, and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated this 28<sup>th</sup> Day of February, 2018

“Signed and Sealed”

---

Jenna McKenzie, P.Geo.  
Ronacher McKenzie Geoscience