Centre of Excellence for Sustainable Mining and Exploration (CESME)

Annual Report to the Office of Research Services

August 2022

Lakehead UNIVERSITY

CENTRE OF EXCELLENCE FOR SUSTAINABLE MINING & EXPLORATION

Executive Summary

In the past year CESME has achieved the following:

- Successfully completed a review by the Senate Research Committee
- Co-hosted a successful in-person event associated with the PDAC meeting
- Provided scholarships to support graduate research
- Handed over the development of the Asin Certificate in Geological Studies to the Vice Provost Indigenous Initiatives
- Sponsored an in-person workshop
- Facilitated new research initiatives between local industry and LU researchers

CESME goals & objectives

As outlined in the original proposal to the Senate Research Committee the purpose, rationale, mission and goals of the Centre of Excellence in Sustainable Mining and Exploration (CESME) are as follows:

Purpose

CESME will encourage and support research, education and outreach activities regarding the nature and impacts of mineral resource exploration and extraction particularly in Northern Ontario.

Rationale

Northern Ontario's dynamic mining sector is booming, creating challenges regarding how best to undertake sustainable economic development while ensuring environmental protection and respecting constitutionally protected Aboriginal and Treaty rights. CESME will help address these challenges by linking Lakehead University researchers with partners from First Nation, Métis and local communities, government, and industry. This collaborative approach recognizes that Canadian natural resource development requires sophisticated planning, collaboration, assessment, implementation, and remediation strategies that are calculated to minimize negative environmental, socio-economic, and cultural impacts. CESME uses the term "sustainable" to imply reconciliation of the three pillars of environmental, social equity, and economic demands (2005 World Summit on Social Development) that is now widely recognized by the mining industry. To this end, CESME is structured under three pillars: 1) Mining, Exploration and Mineral Processing; 2) Environmental Impacts; and 3) First Nation, Métis and Local Community Engagement.

Through the Centre academic, community, government, and industry partners will carry out cutting-edge research in discovery, advanced exploration, and development, and address the environmental, social and cultural aspects of mineral extraction.

Mission

CESME will:

- Support the development of community-based research and outreach activities in both the Lakehead University community and the region as a whole;
- Generate research projects that facilitate sustainable resource development in Northern Ontario and evaluate the current and future ecological, social, cultural and economic impacts of development; and
- Apply research outcomes from Northern Ontario projects to broader sustainable development issues in other northern Canadian and international jurisdictions and apply the lessons learned in other jurisdictions to Northern Ontario.

Goals

CESME will:

- Increase the capacity for mineral deposit research at Lakehead University and enhance the reputation of the institution in the region, nationally and internationally;
- Increase the capacity for research into the environmental impacts of mining and the sustainability of this activity in Northern Ontario;
- Increase the capacity for research into the social and cultural impacts of mining, especially the involvement of local and First Nation and Métis communities and the recognition of Aboriginal and treaty rights;
- Increase the capacity for research into mining and mineral processing;
- Initiate interdisciplinary research into these fields and develop multidisciplinary research proposals for funding agencies and research partners;
- Bring together a diverse range of researchers at Lakehead University working in fields related to mining exploration, sustainable mining, and environmental and community impacts; and
- Make Lakehead University the hub for sustainable resource extraction research in Northern Ontario.

Progress towards the Centre's goals

In our original proposal to the Senate Research Committee we indicated that we would achieve the goals of the Centre by undertaking a number of activities. This section lists those activities and highlights progress made.

1. *Initiate discussions with the wider community to shape the research activities of the Centre.*

   We have continued discussions with a diverse group of research partners including First Nations educational organisations. We have been working with Mining Matters to facilitate their engagement with schools and communities in Northern Ontario. In the past year they have delivered 18 virtual workshops for grade 4 classes reaching 410 students and 18 teachers. We are also in discussion with Dr. Melville, Dean of Education, to provide geoscience education to pre-service teachers.

2. *Generate multidisciplinary research proposals and apply for external funding*

   CESME has supported the establishment of a research partnership with Gold Shore Resources Inc. that has received funding from an NSERC Alliance grant and Mitacs. The Centre is also supporting discussions with Wyloo, Nighthawk Gold and Evolution Mining to establish new research partnerships. Following an approach from BMO Global Asset Management we connected them with Dr. Martha Dowsley who is in discussion with them to undertake a small research project focused on stakeholder perspectives on a 'Just Transition'.

3. *Invite and fund proposals for research and outreach activities*

   We continue to solicit proposals from the University community

4. *Recruit and foster faculty, postdoctoral fellows, postgraduate, graduate, and undergraduate student participation*

   CESME is not directly supporting any Postdoctoral Fellows at this time but two PDFs are supported through the NOHFC Industrial Research Chair in Mineral Exploration. We are supporting the MSc research Sergio Bautista, a MSc student in the Department of Geology through the Dr. Melville Bartley Memorial CESME award. Sergio is working to better understand oxide mineralization at the Lac des Iles mine.

5. *Establish working relationships with similar national and international centres (e.g., Mineral Deposit Research Unit (MDRU) at the University of British Columbia, Mineral Exploration Research Centre (MERC) at Laurentian, CODES – ARC Centre of Excellence in Ore Deposits at the University of Tasmania, Centre for Exploration Targeting (CET) at the University of Western Australia)*

   We have a very successful collaboration with CODES and have established a new partnership with the Mineral Deposit Research Unit at UBC which has led to the submission of a $4,050,000 NSERC Alliance grant supported by 15 mining companies

6. *Develop and maintain a website for the Centre*

   We have established a website that highlights CESME activities and acts as a repository for our publications and videos of our guest speakers.

Members of CESME

The Advisory Board for CESME continues to operate efficiently having met three times by teleconference in the past year. The membership comprises:

- Ms. Sue Craig, Consultant - Chair
- Mr. John Mason, CEDC
- Mr. Glenn Nolan, Noront
- Dr. James Franklin, Consultant
- Dr. Scott Jobin-Bevans, Consultant
- Mr. Gord Maxwell, Consultant

John Mason recently retired from the CEDC and has stepped down as Chair of the Advisory Board, Sue Craig has kindly agreed to take on that role. The service of these individuals is greatly appreciated and we look forward to working with them to strengthen CESME in the coming years.

The following faculty members have agreed to lead the three research pillars of CESME:

- Dr. Pedram Fatehi continues as the leader of the Mining, Exploration and Mineral Processing pillar
- Dr. Michael Rennie, continues as the leader of the Environmental pillar
- We are currently seeking a leader for the Indigenous pillar.

The following faculty members have signed up as CESME members:

Dr.	Matthew	Boyd	Anthropology
Dr.	Andrew	Conly	Geology
Dr.	Jian	Deng	Civil Engineering
Dr.	Amanda	Diochon	Geology
Dr.	Martha	Dowsley	Anthropology
Dr.	A. Ernest	Epp	History
Dr.	Pedram	Fatehi	Chemical Engineering
Dr.	Philip	Fralick	Geology
Dr.	Scott	Hamilton	Anthropology
Dr.	Rachel	Jekanowski	English, Memorial University
Dr.	Peter	Lee	Biology (emeritus)
Dr.	Kam	Leung	Biology
Dr.	Baoqiang	Liao	Chemical Engineering
Dr.	Nancy	Luckai	Natural Resources Management
Dr	Rob	Petrunia	Economics
Dr.	Mike	Rennie	Biology
Dr.	Karl	Skogstad	Economics
Dr.	Robert	Stewart	Geography
Dr.	Shannon	Zurevinski	Geology

The following adjunct faculty are also members of CESME:

Dr.	Greg	Ross	NOSM
Dr.	Robert	Mackereth	Centre for Northern Forest Ecosystem Research

In addition, there are two Post Doctoral Fellows (Wyatt Bain and Matt Brzozowski) affiliated with CESME.

Research Projects & Scholarly Activities

Postdoctoral Certificate in Geological Studies

Working closely with Denise Baxter, Vice Provost Indigenous Initiatives, we have completed the development of the course materials for the Asin Certificate in Geological Studies (previously the Indigenous Certificate in Geological Studies). The documentation has been submitted for review by Senate.

Postdoctoral Fellow research activities

Dr. Matt Brzozowski began working on the Clean Air Metals project in November 2021, focusing on the Current Cu–platinum-group element (PGE) deposit (~80 km north of Thunder Bay, Ontario). The goals of his portion of this project are to develop a deposit model that can be used during mineral exploration. All field sampling, and petrographic and analytical (SEM–EDS, LA–ICP–MS, and SIMS) work has been completed. These data, together with assay data provided by Clean Air Metals, have been used to characterize the magmatic and post-magmatic processes that formed and modified the Cu–PGE mineralization in the Current deposit. The results of this project were presented at the 2021 ILSG conference and the 2022 International Platinum Symposium, and a manuscript is ready for submission. Matt is also co-supervising three MSc students on the Clean Air Metals project. Two of these students have collected all of their samples and data, and have begun data interpretation and thesis writing. Preliminary results of these MSc thesis have been presented at the 2022 ILSG conference and 2022 PDAC Student Colloquium; both students won “Best Student Poster” awards at these conferences. Field sampling for the third MSc student will begin at the end of August 2022. Working with Dr. Hollings Matt also developed additional projects with Generation Mining Ltd, the exploration company operating the Marathon Cu–Pd project (near Marathon, Ontario). One of these projects is in collaboration with Enersoft, a company that provides hyperspectral services to the resources industry; it aims to develop hyperspectral technology to Ni–Cu–PGE exploration. This project, which involves a BSc student, is still in the development stages. The second project focuses on characterizing the contamination history of Eastern Gabbro of the Coldwell Complex and how it relates to Cu–PGE mineralization by determining the S isotope composition of sulfides in the mineralized deposits and occurrences north of the Marathon deposit. Preliminary results of this study have been reported in a BSc thesis in 2022 that Matt co-supervised. Additional work is underway, with samples already prepared for S isotope measurement by SIMS that is scheduled to be completed in November 2022 at the University of Western Australia. Lastly, a manuscript has been prepared for a project in collaboration with the Chinese Academy of Sciences aimed at utilizing Re–Os isotopes to characterize the nature of the mantle sources that contributed magma to Cu–PGE-mineralized and barren mafic–ultramafic intrusions in the north–northeast portion of the Midcontinent Rift. Lastly, a manuscript has been accepted in the Journal of Petrology that utilizes Mg and Fe isotopes to characterize the metasomatic processes that affected the mantle sources that fed the Coldwell Complex of the Midcontinent Rift.

Dr. Wyatt Bain is working on the “Geology, Geochemistry and Magmatic Evolution of the Lac Des Iles intrusive suite. This project focuses on the array of mafic-ultramafic satellite intrusions associated with the world class Lac Des Illes PGE deposit in northwestern Ontario. These include the Legris Lake, Tib Lake, Wakinoo Lake, Demars Lake, Buck Lake, and Dog River cumulate complexes and several other minor intrusive bodies to the south and west of the main PGE showing at Lac Des Illes. Over the last year we successfully executed a field campaign focused on the collection of surface outcrop and drill core samples from the major cumulate lithologies in the Legris, Tib, and Wakinoo-Demars systems (the most prospective PGE exploration targets in the Lac Des Iles intrusive suite). Samples from each system were subsequently submitted for whole rock analysis and thin section preparation in mid-summer of 2021. Throughout the fall and winter of 2021, the Legris system became the primary focus of analysis with additional SEM-MLA, EPMA, whole-rock Sm-Nd isotope, U-Pb geochronology, *in situ* sulfur isotope, and sulfide trace

element data being gathered throughout that time. Data interpretation took place during the winter and spring of 2022 and included the development of an in house, excel-based worksheet for melt modeling and parental magma calculation from whole-rock data. During the early summer of 2022 the results of our work on the Legris Lake system were presented at three separate conferences (GAC-MAC, Goldschmidt, and the Early Career Platinum Symposium) and a manuscript focused on the Legris system is currently in preparation with the aim of submitting it for review to Mineralium Deposita by September 1. In addition, field work focused on the intrusive complexes south of the Tib and Legris Lake systems was conducted in mid-July. This round of field work saw the successful collection of samples for U-Pb geochronology and whole rock analysis from the Demars Lake, Wakinoo Lake, Buck Lake, and Dog River intrusions and their associated host rocks. Ongoing work over the summer and fall of 2022 will focus on the geochemistry of the Tib Lake systems and the collection and interpretation of whole rock Sm-Nd and in situ S isotope data from the Tib Lake, Demars Lake, Wakinoo Lake, Buck Lake, and Dog River systems. The aim of this second phase of the PDF project will be producing a second manuscript focused on a comparison of the petrogenesis, tectonic setting, and parental magmas of these systems.

In addition to the PDF project described here, a companion project focused on melt inclusions form four mid-continent rift related systems (Pukaskwa Dikes, the Osler Volcanics, and the Seagull and Thunder layered mafic complexes) was also initiated during the fall of 2021 and continues to the present. Following sample preparation, melt inclusion analysis began during the spring of 2022 with conventional microscopy, SEM imaging, and EDS analysis of diopside- and olivine-hosted inclusions. This was followed by detailed Raman spectroscopy and microthermometry at the University of Alberta and LA-ICP-MS analysis at the USGS facility in Denver. This analysis generated a robust, high-quality petrographic and geochemical data set on both glassy and polycrystalline inclusions from all four systems. Among the current findings of this work is the recognition of salt melt inclusions in mineralized portions of the Seagull and Thunder intrusions. Salt melts are distinct from the silicate melts and hydrothermal solutions typically associated with layered-mafic intrusions and represent a novel fluid type with important potential implications for the formation and enrichment of PGE mineralization in these systems. Data processing and interpretation are ongoing with the near-term aim of incorporation of the Pukaskwa data into a manuscript which is currently in prep. Inclusion data from the other three systems will be complied alongside exiting data form two MS theses and other unpublished data from the Osler Volcanics, and the Seagull and Thunder layered mafic complexes.

Other activities

CESME is continuing to engage with local mining companies by hosting “Discovery Days” when researchers at Lakehead present their work to company representatives in order to develop new partnerships. With the possibility to start in-person meetings again we will be reaching out to local companies to restart these successful meetings.

CESME participated in the Mining the Northwest virtual event on November 30 and December 1, 2021. This included hosting a virtual booth and coordinating a session on Career/Education/Training which included the following speakers:

Dr. Pete Hollings, Dept. of Geology, Lakehead University- "*The Center of Excellence for Sustainable Mining & Exploration (CESME) - a hub for industry linked research & training*"

Wilson Luo, Dir., Business Dev., Mitacs & **Bill Maloney**, Directory Industry Research Partnerships, Lakehead University – "*Mitacs funding for research & innovation internships*"

Joanna Hodge PhD, Prof. of Geology & ERT Program Coord., Flemming College – "*The Earth Resources Technician Co-op Program at Fleming College: A Hidden Gem!*"

Denise Baxter, Vice-Provost, Indigenous Initiatives & **Lisa Primavesi**, Indigenous Access & Programs Coord Lakehead University – "*Asin Certificate in Geology, ISTEM Access Programs*"

Melissa Hardv-Giles, Owner ImmersiveLink – Origin – "*Changing The Way We Connect To Career & Culture - Virtual Learning & Development Solutions*"

Caitlin Reeves, Employer Relations & Co-op Advsr., & **Sierra Lemonius-Walker**, Employer Relations Specialist, Lakehead University – "*Work Integrated Learning & Cooperation Opportunities at Lakehead University*"

Educational Activities

CESME sponsored the Lakehead University SEG student chapter's short course on "Gold deposits in greenstone belts: settings, styles and exploration" by Dr. Francois Robert. The workshop took place on March 26th, 2022 with 35 attendees. CESME also sponsored the 68th Annual Institute on Lake Superior Geology Meeting in Sudbury, Ontario. The meeting took place on May 10 and 11 with 90 people in attendance. Finally, we supported the Thunder Bay Historical Museum Society in a presentation and book signing from authors John Sandlos and Arn Keeling for their book "Mining Country: A history of Canada's mines and mining".

Undergraduate and graduate training

We have supported two graduate students through through the Dr. Melville Bartley Memorial CESME Award as discussed above.

Financial statement

The main CESME account has been relying on residual funds left from running our conference and occasional donations. These funds have been expended meaning that the only funds available to directly support CESME activities come from the Research Support Fund. While this support is appreciated there are limits to how those funds can be used which may impact future activities.

The statement provided below covers the 2021-2022 financial year.

Item	Credit	Debit
Carry Forward	$00.00	

Transfer from Research Support Fund	$3929.70	
Donations		
Travel & Conferences		$ 1396.04
Sponsorship (*SEG Workshop and ILSG conference*)		$1500.00
Printing		$0.00
AV equipment for making promotional videos		$833.66
Promotional materials		$200
Subtotal	*$*3929.70	*$*3929.70
Balance	**$00.00**	

One-year and five-year plans

The immediate goals of CESME are as follows:

- Work with the Advisory Board to implement the new Strategic Plan for CESME and the Action Items within it
- We continue to seek funding both from research councils and donors to support graduate and undergraduate research.
- We are still considering the possibility of hosting another conference at Lakehead or alternatively providing support to other related events on campus.
- We continue to engage with faculty across campus to encourage them to participate in and identify CESME activities.

Having met one of our medium-term goals of establishing a research Chair under the Mining and Exploration Pillar we are still seeking to establish two research chairs, one related to each of the remaining CESME pillars (Environmental Impacts and First Nation, Métis and Local Community Engagement). These chairs are critical to the long-term success of CESME as they will provide the core researchers around which Centre activities can be developed. In addition to funding the Chair we are seeking ways to support graduate students and Post-Graduate Fellows who will undertake much of the research. We are investigating a number of mechanisms to fund these chairs, including:

- Corporate donations;
- Philanthropy

We are working closely with the Office of Research Services and External Relations to achieve this goal.

2022-2023 Budget*

Item	**Cost**
Attend PDAC meeting to promote CESME (2 x$2,000 people)	$4,000
Attend Roundup meeting to promote CESME (2 x$2,000 people)	$4,000

Conferences for CESME members	$4,000
Teaching relief for Director (1 x $7,800)	$7,800
Promotional materials	$1,000
Invited speakers	$3,500

* Scholarships provided by CESME are not included here.

Emerging Trends

CESME activities are more important than ever in the face of changing developments and conditions in the mining sector in northern Ontario. The mining industry is very active in Northern Ontario which has led to high employment rates and a number of funding opportunities for research, however, it has also highlighted the need for a greater number of graduates from the geoscience programs at Lakehead. Enrolments are down across Canada and we are working to expose school age students to geology and mining through collaborations with organisations like Mining Matters and working directly with local schoolboards and the Faculty of Education. The need for increased training to meet the growing economic development needs in Northern Ontario means that this will continue to be a priority for the Centre.

Appendix 1

Media reports, posters and publications

From: **Glenn Dredhart** g.dredhart@canadiantradex.com
Subject: Mining the Northwest Post "Career, Education and Training Conference"
Date: November 12, 2021 at 8:55 PM
To: Peter Hollings pnhollin@lakeheadu.ca

GD

Good evening Peter please find attached a conference schedule for the December 1st day of the Mining the Northwest Virtual Expo and Conference. Please let me know if there are any changes you wish to make to the Lakehead morning session. If there are no changes please feel free to share this post with your speakers so that they may share it with their associates and colleagues. You may want to send this post on to the high schools as they may nwant their grades 11 and 12 students to participate in the subject being addressed.

Thanks
Glenn Dredhart

MINING THE NorthWest VIRTUAL EVENT

Conference Agenda

Career/Education/Training - *When opportunity knocks*

Wednesday December 1 Day 2

AM

SPONSORED & MODERATED BY Lakehead UNIVERSITY

09:00-09:20	 **Dr. Peter Hollings**, CESME Dir., Dept. of Geology, Lakehead University	The Center of Excellence for Sustainable Mining & Exploration (CESME) – a hub for industry linked research & training
09:25-09:45	 **Wilson Luo** (pic), Dir., Business Dev., Mitacs **Bill Maloney**, Directory Industry Research Partnerships, Lakehead University	Mitacs funding for research & innovation internships
09:50-10:10	 **Joanna Hodge PhD**, Prof. of Geology & ERT Program Coord., Flemming College	The Earth Resources Technician Co-op Program at Fleming College: A Hidden Gem!
10:15-11:00	 **Denise Baxter**, Vice-Provost, Indigenous Initiatives & **Lisa Primavesi**, Indigenous Access Programs Coord, Lakehead University	Asin Certificate in Geology & ISTEM Access Programs
10:40-11:00	 **Melissa Hardy-Giles**, Owner ImmersiveLink - Origin	Changing The Way We Connect To Career & Culture - Virtual Learning & Development Solutions
11:05-11:25	 **Caitlin Reeves**, Employer Relations & Co-op Advsr., & **Sierra Lemonius-Walker**, Employer Relations Specialist, Lakehead University	Work Integrated Learning & Co-operation Opportunities at Lakehead University

SPONSORED & MODERATED BY North Superior Workforce Planning Board

	11:30-12:30		**Madge Richardson**, Executive Dir., North Superior Workforce Planning Board	Conference & Virtual Tour of Workforce North
PM		SPONSORED & MODERATED BY Confederation COLLEGE		
	12:30-12:50	 	**Nick Iachetta**, Program Mgr. & **Carol Cline**, Dir., Workforce Dev., Confederation College	Collaboration of Industry & Confederation College – Meeting Labour Needs. Part 1
	01:00-01:20		**Marie-Hélène Gélinas** Mgr., HR, Greenstone Mine	Collaboration of Industry & Confederation College – Meeting Labour Needs. Part 2
	01:30-01:50	 	**John Kantola**, Chair, Trades & Apprenticeship **Colin Kelly,** Dean of Engineering Technology, Trades, & Aviation, Confederation College	Skilled Trades & Technology Programs At Confederation College
	02:30-02:50	 	**Tonia Oldford**, HR Mgr., Barrick Gold **Pauline "Pinky" McCrae**, Employment Advsr., Northwest Employment Works	Collaboration of Industry & Confederation College – Meeting Labour Needs. Part 3
	02:00-02:20		**Ted Kirkpatrick** (pic), Dir. of Business Devt. **Curtis Lavoi**, HR Representative **Shaun Padulo**, President Hedle Shipyards	The Future of Shipbuilding in Ontario

The Lakehead University SEG student chapter is pleased to offer a short course on:

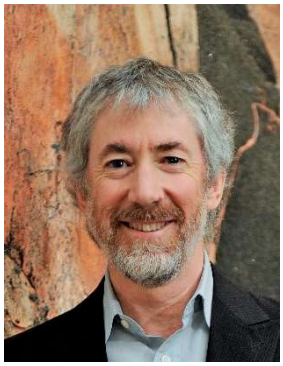
Gold deposits in greenstone belts: settings, styles and exploration

Saturday, March 26th, 2022

Oliver Road Community Centre

563 Oliver Road, Thunder Bay, ON

The course will provide an overview of greenstone belts including their architecture and evolution, discuss the distribution and timing of the settings of gold deposits in greenstone belts, the diversity of these deposit types, and the practical applications in exploration.



About the presenter: François Robert

François holds a degree in Geological Engineering from Ecole Polytechnique in Montreal, where he also obtained MSc and PhD degrees. His PhD focused on the classic orogenic Sigma gold-quartz vein system in Val d'Or, Quebec. This was followed by a post-doctorate at the University of Michigan.

He joined the Geological Survey of Canada in 1985 as a research scientist where he carried out applied research on gold deposits in Canada and abroad. In late 1997, he joined Barrick Gold Corporation where he occupied various exploration positions in Canada, Australia, and South America, broadening his experience to most types of gold deposits. He was Chief Geologist - Global Exploration from 2006 until his retirement at the end of 2019. He is currently an independent, part-time consultant, sharing his experience on selected Industry projects.

He has published numerous papers in scientific journals and volumes, and served on many committees of scientific organizations, including Presidency of SEG in 2015. He received multiple national and international awards, including SEG's Lindgren, Silver Medal, and Ralph Marsden awards.

Course Agenda: Saturday, March 26th, 2022, 9:00 am – 5:00 pm

9:00 am: Welcome and Introductions

9:10 am: Module 1: Key elements of greenstone belt architecture and evolution

10:40 am: Coffee Break

11:00 am: Module 2: Distribution and setting of gold deposits

12:30 pm: Lunch Break

1:30 pm: Module 3: Diversity of deposit types

3:00 pm: Coffee Break

3:20 pm: Module 4: Practical applications in exploration

4:50 pm: Concluding remarks

5:00 pm: Close

Registration Fees
$200 for Professionals/$40 for Students
(Lunch and coffee to be provided)

Please complete the registration form below and return it with a cheque (payable to Lakehead University SEG Student Chapter) or cash to:

Lakehead University SEG Student Chapter
c/o Department of Geology
Lakehead University
CB 4064, 955 Oliver Rd.
Thunder Bay, ON, Canada P7B 5E1

Please send an email to Rebecca Price (rprice2@lakeheadu.ca) to express your interest in attending the course.

For more information about the course or registration you can contact Rebecca Price (rprice2@lakeheadu.ca), Connor Caglioti (ccagliot@lakeheadu.ca), or Pete Hollings (pnhollin@lakeheadu.ca).

Registration Form

Lakehead University SEG Student Chapter Short Course:

Gold deposits in greenstone belts: settings, styles and exploration

March 26th, 2022, Thunder Bay, Ontario

Name: _____

Affiliation/Address: _____

_____

Phone: _____

Email: _____

Back

Add to my calendar

Author Event on Canadian Mining History

30 May 2022
7:30 PM - 9:30 PM
Thunder Bay Museum
10 registrant

You are invited to join the Thunder Bay Historical Museum Society for a presentation and book signing from authors John Sandlos and Arn Keeling, in partnership with the the Lakehead University Department of Geography and the Environment, Department of History, the Centre of Excellence for Sustainable Mining and Exploration, and the James Lorimer & Co Ltd.

REGISTRATION

- **In-person Attendee**

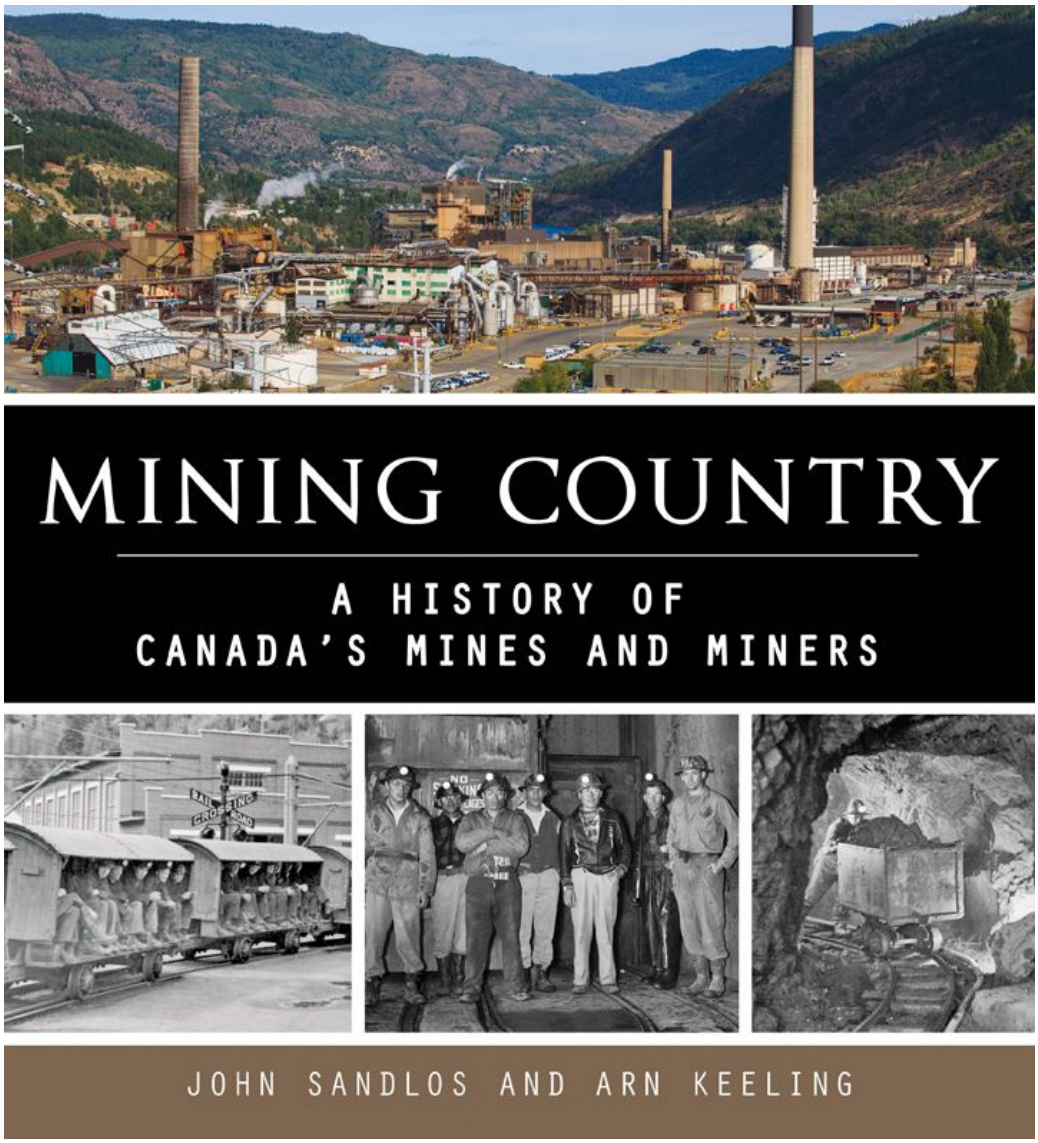
This will be an **in-person and virtual event.** This event will be recorded for rebroadcast later.

CLICK HERE to view the webinar.

- **Virtual Attendee**

Full ZOOM info below.

REGISTER



Description:

Authors of *Mining Country: A History of Canada's Mines and Miners* Arn Keeling and John Sandlos will be chatting about the history of mining in Canada and how the industry has shaped the country. There are countless mining towns across Canada and each one has played an important role in mining history. Arn and John will talk specifically about how mining in northern Ontario has shaped both local and national history.

Speaker Bios:

John Sandlos is a professor of history at Memorial University of Newfoundland, with a research focus on the history of abandoned mines in Northern Canada. He is the author of Hunters at the Margin and co-editor (with Arn Keeling) of Mining and Communities in Northern Canada: History, Politics, Memory. He lives in St. John's, Newfoundland and Labrador.

Arn Keeling is a professor of geography at Memorial University of Newfoundland. His research examines the environmental legacies of abandoned mines, mine closure and remediation, and the social issues surrounding environmental contamination and its effects on northern Indigenous communities. He co-directed the Toxic Legacies Project with John Sandlos, conducting community-engaged research on the history and legacy of Giant Mine. He lives in St. John's, Newfoundland and Labrador.

- Free Museum Admission during the event
- Refreshments will be available
- Book signing immediately after the talk
- Book sales

ALL ATTENDEES OLDER THAN 5 YEARS WILL NEED TO SHOW PROOF, AT THE TIME OF ENTRY TO THE MUSEUM, OF VACCINATION FOR COVID-19 USING A QR CODE. MORE INFORMATION ON HOW TO ACQUIRE THE QR CODE: https://covid-19.ontario.ca/get-proof/

PROOF OF VACCINATION IS NOT REQUIRED FOR REGULAR VISITS TO THE MUSEUM'S EXHIBIT GALLERIES.

Parking Map

ZOOM INFORMATION

Hi there,

You are invited to a Zoom webinar.

When: May 30, 2022 07:30 PM Eastern Time (US and Canada)

Topic: Author Event on Canadian Mining History

Please click the link below to join the webinar:

https://us02web.zoom.us/j/86028780298?pwd=YS9CbmlFMk5EZEt3dzV4dlBCUWNaQT09

Passcode: 410684

Or One tap mobile :

Canada: +14388097799,,86028780298#,,,,*410684# or +15873281099,,86028780298#,,,,*410684#

Or Telephone:

Dial(for higher quality, dial a number based on your current location):

Canada: +1 438 809 7799 or +1 587 328 1099 or +1 647 374 4685 or +1 647

558 0588 or +1 778 907 2071 or +1 780 666 0144 or +1 204 272 7920

US: +1 312 626 6799 or +1 346 248 7799 or +1 646 558 8656 or +1 669 900 9128 or +1 253 215 8782 or +1 301 715 8592

United Kingdom: +44 203 481 5237 or +44 203 481 5240 or +44 203 901 7895 or +44 208 080 6591 or +44 208 080 6592 or +44 330 088 5830 or +44 131 460 1196

Finland: +358 9 7252 2471 or +358 3 4109 2129 or +358 9 4245 1488

Webinar ID: 860 2878 0298

Passcode: 410684

International numbers available: https://us02web.zoom.us/u/k3oxizIp5