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# Skills Development in Northern Mining Regions

Lessons From Manitoba

Case Study | November 4, 2021





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Blueprint

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# Contents

- 4 Lessons Learned
- **5** Aligning Skills Development With Ebb and Flow in the Mining Sector
- 8 Skills Development in Northern Manitoba
- **11** Commodity Markets Drive Mining Sector Change
- **12** Manitoba's Mining Workforce Has Shrunk
- **13** Technical Skills Increasingly Critical in Mining
- **15** Young Indigenous Workers Want Job Skills
- **17** Enhancing First Nations Participation in the Mining Sector
- **19** Lessons for Other Northern Mining Regions

- 22 Appendix A Methodology
- 23 Appendix B

Exhibit 1: Building Skills in Northern Manitoba The Ecosystem and the Players

Exhibit 2: Phases of the Mineral Development Cycle

26 Appendix C

The Skills Ecosystem for Miners, Managers, and Tradespeople

29 Appendix D

Indigenous Participation in Mining Occupations

**31 Appendix E** Bibliography

# **Lessons** Learned

- Northern Manitoba's skills development ecosystem revolves around a single post-secondary education (PSE) institution and a few large private sector employers. The policy environment is complex, which can complicate collaboration and innovation. Plus, the ecosystem operates across challenging geography that requires many learners to travel far from home to study and work.
- Organizations in this skills ecosystem are challenged to keep up with fluctuations in the mining sector. Local PSE can play a leadership role by connecting and coordinating the members of the ecosystem.
- 3 Developing job skills in remote populations is a multi-year process. When planning projects, mining companies need to engage early with Indigenous partners and take the long view.
- Some youth in remote communities may not be ready for training. Culturally appropriate mental health and wellness programming can help build learners' confidence and motivation to prepare them for job readiness and essential skills training.

- 5 Building trust between mining companies and communities is difficult when boom-time hiring is followed by layoffs during downturns. Skills development coordination bodies can provide a neutral ground to manage uncertainties.
- 6 Mining's rotational work life can be a big change for Indigenous workers coming from remote communities. Skills development programs need to address how rotational work can affect family dynamics and help workers learn to navigate that change to enable lasting employment.
- Learners can benefit from interventions such as micro-credentialing and virtual reality. These short, targeted approaches hold promise for delivering skills to Northern Manitoba's Indigenous workforce.



# **Aligning Skills Development With Ebb and Flow** in the Mining Sector

For many Northern Indigenous communities, mineral exploration properties and active mines are the closest employers. Mining is big business in Northern Manitoba. The industry has been a strong source of employment for Indigenous workers, with accessible entry-level positions and opportunities to learn on the job.

In 2016, more than 7,000 Indigenous people in the region worked in mining-related occupations, making up 61 per cent of people in those jobs.<sup>1</sup> (See Appendix D–Indigenous Participation in Mining Occupations.)

While the benefits of short-term job training are attractive, Indigenous communities have to make complicated decisions about economic development that have long-term implications. Mining employment varies with commodity cycles, and individual mines have their own life cycles, with changing employment needs.<sup>2</sup>

In 2017, underground miners were the biggest occupation group in the region. But their work is at risk from automation and increased competition from out-of-region rotational workers. Between 2011 and 2017, Northern Manitoba lost more than 300 mining jobs as operating mines scaled back, and layoffs have continued in the past four years.<sup>3</sup> Meanwhile, the few mines that are in development are still years away from production. There was no overall job growth in Northern Manitoba between 2011 and 2017, while the population increased by about 4,000.<sup>4</sup>

Mining in Northern Manitoba isn't dead. Nickel is touted as a growth commodity due to projected demand for e-vehicle batteries and stainless steel, while copper is essential to electricity infrastructure.<sup>5</sup> And the price of gold has risen to new highs over the past five years. But the pandemic has made it difficult to forecast mining employment post-COVID-19.<sup>6</sup>

4 Ibid., 13.

2 Look North, North Region Economic Profile, 19.

- 5 Marshall, Facts and Figures 2020, 12.
- 6 MiHR, COVID-19 and Labour Market Volatility; MIHRC, Mining Year in Review.

<sup>3</sup> Ibid., 12.

<sup>1</sup> The Conference Board of Canada's analysis of MiHR and Statistics Canada data.

Workers in Northern Manitoba gain the skills they need to adapt to the changing economy from a wide range of organizations that make up the regional skills development ecosystem. (See our primer *Skills Development in the North: An Ecosystem Shaped by Distinct Challenges.*) Everyone in this ecosystem—including education providers, employers, policy-makers, and learners—faces the challenge of keeping up with fluctuations in the mining sector.<sup>7</sup> The skills ecosystem needs to balance the drive to quickly provide skills for jobs currently in demand with the need to keep an eye on new skills and occupations. Three-quarters of potential workers in Northern Manitoba are Indigenous, including Cree, Oji-Cree, Dene, Métis and Inuit peoples. Organizations and people throughout the skills development ecosystem need to understand how a well-coordinated ecosystem can help Indigenous learners build skills for future occupations, including mining and complementary roles that support the rest of the economy.

# "I'd like to have our people in positions where decisions are made that affect us, like at the federal level or at the provincial level. ... We have to occupy these positions to make that change."

Wayne McLeod, Band Councillor, Cross Lake First Nation

7 Look North, Look North Report and Action Plan, 17.



# Northern Canada's Skills Development Ecosystems

It takes a broad ecosystem of interdependent actors – including government, education and training, industry, and learners – to identify the skills needed locally, deliver those skills, and deploy them in jobs. (See our primer <u>Skills Development in the North:</u> <u>An Ecosystem Shaped by Distinct Challenges</u>.)

# **Providing Education and Training in the North**

- High school graduation rates in the North lag southern regions. PSE institutions must bridge the gap by offering upgrading courses.
- There are few Indigenous regional educational authorities, so many skills development functions are performed by small local communities.
- Teacher shortages and turnover are high. Most Northern teacher training programs only focus on K–6 training.
- Only seven Northern economic regions have a local university focused on regional development. In 11 regions, the only local PSE provider is a community college.
- Online training models that depend on broadband Internet connections and household computers are often not feasible.

## **Setting Education Policy in the North**

- Federal policies on Indigenous education and training impact the skills ecosystem. Indigenous governments also play a major role.
- Tripartite agreements that coordinate policy bring in the provincial government as well.
- Training delivery models developed in Southern cities may not be appropriate in Northern communities. Trainers, facilities, and equipment can be much harder to access.

## **Employers Drive Northern** Labour Demand

- The natural resources sector plays an outsized role, leaving Northern regions vulnerable to commodity cycles.
- Large natural resources employers, such as mining or forestry companies, are often the biggest contributors to GDP.
- Indigenous economic development corporations can be significant investors and employers.

### **Supporting Northern Learners**

 Intersecting challenges for Indigenous learners can include remoteness, teacher shortages and turnover, inadequate funding, lack of starter jobs, housing shortages, small schools, and poor Internet service. All of these are compounded by the legacy of residential schools and colonial policies. Support for learners can help them build the essential skills they need to enter work.

## **Coordinating Northern Skills Ecosystems**

 Bodies that coordinate skills development benefit from strong local input, wide representation, community outreach, inter-agency cooperation, cultural competency, flexibility, and shared leadership. At the very least, a bare-bones administration is necessary.



"These micro courses are great for people who have been out of school for quite some time, who lack the time for a traditional credential. What they need is a flexible program."

William Kirkness, Indigenous Liaison, Manitoba Construction Sector Council

# **Skills Development in Northern Manitoba**

The ecosystem that delivers skills to the workforce in Northern Manitoba includes education and training providers, employers and unions, policy-makers, and learners. Key collaboration bodies help coordinate the flow of information and activities among these organizations. (See our primer *Skills Development in the North: An Ecosystem Shaped by Distinct Challenges.*)

Exhibit 1 (Appendix B) shows some of the many players that carry out one or more of the roles and functions essential to skills development in Northern Manitoba.





## **Few Education Providers**

There is only one post-secondary education (PSE) institution in Northern Manitoba: the University College of the North (UCN). It operates two main campuses and 12 regional centres, nine of which are in First Nations. A relatively small institution serving about 3,000 students in 2019,<sup>8</sup> UCN partners with southern PSE institutions to deliver most of its professional programs. While learners can now access many online providers, many Northern communities struggle with reliable Internet access.

The non-profit organization Workplace Education Manitoba (WEM) has three regional facilities offering essential skills for adult learners. Four provincial school boards also deliver schooling and adult education, and many First Nations operate their own education and skills programs. But unlike Northern Saskatchewan and Northern Ontario, there are no Indigenous-owned and controlled PSE institutions in Northern Manitoba. Several provincial sector councils bring targeted skills training into Northern communities.

## **Complex Policy Landscape**

Indigenous Services Canada funds education for the Indigenous population, while First Nations manage their own schools and allocate PSE funding. The province's largest school board, Frontier School Division, serves many Indigenous students, so provincial education policies are also influential. Employment and Skills Development Canada contracts with Indigenous authorities such as Manitoba Keewatinowi Okimakanak (MKO) to fund adult skills development. Individual First Nations have sub-agreements with MKO to arrange specific adult upgrading programs for their members. The Manitoba Métis Federation (MMF) manages federal funding for PSE and adult skills development for Métis citizens in Northern Manitoba.



## **Focused Employers**

Junior mining companies, such as Alamos Gold, and senior companies, such as Hudbay and Vale, support local skills development for their mining operations. They rely on local partners like the Northern Manitoba Sector Council (NMSC) to build career awareness and arrange train-to-hire programs to bring potential workers up to speed. NMSC also provides support to laid-off workers when companies need to downsize their workforces.

## **Vulnerable Learners**

Geographic isolation is a challenge for learners in the 23 Manitoba First Nations that lack an all-weather road.<sup>9</sup> Likewise, learners in communities with poor Internet service are at a significant disadvantage for online learning. Only 2.0 per cent of First Nations reserves and 14.4 per cent of the rural population in Manitoba met the CRTC target for broadband access in 2019.<sup>10</sup> Also, learners from communities that are too small to support a high school must leave home for secondary education and face increased vulnerability.

# **Employers Play a Big Role in Coordinating Skills Development**

The employer-led NMSC plays a backbone role, coordinating between employers, communities, and education providers about upcoming skills needs. Provincial sector councils partner with NMSC to provide specific skills training. The Northern Manitoba Mining Academy (NMMA), part of UCN, has wider board representation but arranges training primarily for the mining industry.

- 9 Indigenous Services Canada, "First Nations in Manitoba."
- 10 CRTC, *Communications Monitoring Report*. The CRTC 2019 target was 50 Mbps (megabits per second) download and 10 Mbps (megabits per second) upload with unlimited monthly data transfer.



# **Commodity Markets Drive Mining Sector Change**

The rise and fall of international commodity prices influences the exploitation of mineral resources. Prices for many precious and base metals have increased during the pandemic, even as oil prices and employment shrank.<sup>11</sup> Depending on whether mining employment remains at lower levels or returns to pre-pandemic patterns, the industry is expected to hire between 30,000 and 48,000 workers across Canada between 2021 and 2025.<sup>12</sup>

At the local level, job opportunities and skills requirements change as individual mine projects move through the five stages of a mine's life cycle: prospecting, discovery, development, production, and reclamation.<sup>13</sup> (See Appendix B-Exhibit 2.) Four main types of private business are involved in the mining cycle: prospectors, junior exploration companies, senior mining companies, contractors, and service providers. While prospectors may be small operators, the activities of both junior exploration companies and senior mining companies require large, high-risk capital investments.

Mining frequently takes place on Crown land that overlaps the traditional territories of Indigenous Peoples. But the industry remains dominated by private sector companies and international conglomerates that are rarely Indigenous-owned. Indigenous people in Manitoba work for many types of mining business, but most Indigenous-owned businesses involved in the mining supply chain are contractors that deliver support services to larger mining companies.

MiHR, Mining Year in Review, 11.
 Ibid., 23.
 MiHR, Guide for Aboriginal Communities.



# **Manitoba's Mining Workforce Has Shrunk**

Manitoba mines make up only 3 per cent of Canadian mineral production,<sup>14</sup> but mining is the biggest contributor to the regional GDP of Northern Manitoba.<sup>15</sup> That's why the province's Look North Task Force identified mining and resource development as a sector with the potential to drive long-term economic growth in the region.<sup>16</sup>

Mining accounted for only 3 per cent of the provincial economy in 2019 and was forecast to shrink to 2 per cent by 2024.<sup>17</sup> The Manitoba workforce in mining, quarrying, and oil and gas has fluctuated over the past 20 years between a low of 2,900 workers in 2003 and a high of 6,500 workers in 2017. By 2020 that number had fallen to 3,900. (See Chart 1.)

Most mineral smelting and refining has left the North over the past decade. At the start of 2021, only three mines remained in production in Northern Manitoba. Hudbay Mineral's 777 copper-zinc mine at Flin Flon is expected to close in 2022. However, its Lalor copper-zinc-gold mine at Snow Lake is ramping up and will absorb some of 777's workers.<sup>18</sup> Vale S.A.'s nickel-copper mine at Thompson has been shedding employees for several years.<sup>19</sup>

### Chart 1

**Employment in Manitoba Mining, Quarrying, and Oil and Gas** (people aged 15 and over)



Sources: The Conference Board of Canada; Statistics Canada.

Some mines are in development, but have done little hiring so far. Rockcliff Metal Corp. is working on three mine sites near Wabodwen, and Callinex Mines Inc. is developing its Pine Bay polymetallic project in Flin Flon. Meanwhile, Alamos Gold is redeveloping the Lynn Lake gold mine. Nevertheless, there are concerns that investor dollars are going to Saskatchewan and Ontario because of uncertainty in Manitoba's permitting processes and land tenure.<sup>20</sup> Some in the sector also believe that Manitoba mining is lagging technologically: for example, by still doing claim staking on the ground.<sup>21</sup>

- 14 Marshall, Facts and Figures 2020, 21.
- 15 Look North, Manitoba Keewatinowi Okimakanak Inc., and Rural Development Institute, Look North Indigenous Economy Report, 11.
- 16 Look North, Look North Report and Action Plan, 17.
- 17 Provincial Outlook tables calculation.
- 18 Parizot, "Hudbay Aims to Double Gold Production."
- 19 Graham, "Elimination of Nearly 150 Jobs."

20 Masson, "Message from the MSPDA President," 8. 21 Interview participant, 2021.

# **Technical Skills Increasingly Critical in Mining**

Mine work is increasingly skilled work. Thirty years ago, young people could drop out of high school, go into mining, and make a good career. But over the past 20 years, the number of Canadians working in mining who have a post-secondary certificate or diploma has increased by 50 per cent, while workers with no qualifications have declined by 60 per cent.<sup>22</sup> This lowest-qualified group was also the hardest hit by pandemic-related job losses.<sup>23</sup>

Mining innovation is increasingly high-tech. Mining companies in Canada are looking to make the most of data analytics, automation, and electric and battery-operated vehicles. The pandemic has increased pressure to improve efficiency by using digital technologies like cloud analytics, sensors, advanced robotics, virtual reality (VR), and artificial intelligence (AI).<sup>24</sup>



"I went to school to become a geologist and then very quickly found out that the career choices are limited, in that I could not go back to my reserve to a job. So any student would see that and think, 'But then I lose my home.' And that has always bothered me."

22 MiHR, *Mining Year in Review*, 16.23 Ibid.24 MiHR, *The Changing Nature of Work*, 60.

Linda Murphy, BSc in Geological Sciences, Professional geoscientist (P. Geo), Hollow Water First Nation

This means mining companies are now prioritizing technical skills such as computer programming and systems analysis.<sup>25</sup> But taking full advantage of these technologies depends on high-speed broadband Internet infrastructure.

Meanwhile, the mining occupations most at risk from automation are production occupations. This makes Indigenous workers vulnerable, as they work mostly in these occupations as underground miners, heavy equipment operators, and mine labourers.<sup>26</sup>

The Mining Industry Human Resources Council (MiHR) suggests that the digital transformation of mining will affect different groups of workers at different times. This will complicate planning for skills development. But employees will certainly need higher skills to enter mining occupations and require continuous skills upgrades. Essential skills like literacy, numeracy, and digital skills are foundational to keep up on this learning trajectory.<sup>27</sup>



25 Ibid., 2.
 26 Ibid., 29.
 27 Ibid., 51.

# STEM Occupations Are in Demand

The top six occupations currently in demand in mining all require science, technology, engineering and mathematics (STEM) education and skills:<sup>28</sup>

- electrical engineers
- automation engineers
- instrumentation technologists
- instrumentation technicians
- network analysts
- network programmers



28 Ibid., 14.

# **Young Indigenous Workers Want Job Skills**

Education levels among the Indigenous population of Northern Manitoba have lagged those of the non-Indigenous population, making skills development a pressing problem for this growing workforce. (See Table 1.) Nearly three-quarters of the regional population are Indigenous and nearly 80 per cent live on reserve. More than 17,000 live in communities without an all-weather connection to a provincial highway.<sup>29</sup> The population is young and the labour force was expected to grow by 10 per cent between 2016 and 2026.<sup>30</sup> Over a quarter of this Indigenous workforce currently works in occupations that are at risk of automation and difficult to transition out of into more stable positions.<sup>31</sup> Micro-credentials – certificates of assessed competencies that complement or contribute to a formal qualification – can be a stepping stone to better jobs for this population.<sup>32</sup> Well established in the construction sector in Northern Manitoba, micro-credentials are a tool that other sectors in the North can use to start Indigenous workers on the road to longer formal training. (See "Bringing Trades Micro-credentials Into Remote Communities.")

### Table 1

### Highest Level of Education in Northern Manitoba, 2016

(population aged 25-64)

	Total	Less than high school		High school		Trades qualification		College or some university		University graduate	
		No.	%	No.	%	No.	%	No.	%	No.	%
Total	40,865	15,285	37	9,910	24	3,575	9	7,565	19	4,525	11
First Nations	25,350	12,835	51	5,530	22	1,810	7	3,700	15	1,465	6
Métis	2,875	835	29	740	26	335	12	705	25	265	9
Non-Aboriginal identity	12,455	1,555	12	3,600	29	1,420	11	3,100	25	2,770	22

Sources: The Conference Board of Canada; Statistics Canada.



29 Manitoba Public Insurance, "Remote Area Registrations."

30 Look North, Manitoba Keewatinowi Okimakanak Inc., and Rural Development Institute, Look North Indigenous Economy Report. 31 Gresch, Darren, *Responding to Automation*.32 MCSC, "MCSC Micro Courses."

# **Bringing Trades Micro-credentials Into Remote Communities**

Mining and construction go hand in hand. As the liaison between the provincial construction industry and the education sector, the Manitoba Construction Sector Council (MCSC) plays an important role in developing skilled construction workers who will support new and existing mines.

MCSC offers a suite of micro-credential courses that are particularly useful for Indigenous learners who want flexible options to build entry-level skills that can lead to formal trades training.<sup>33</sup> More than 700 members of remote Indigenous communities benefited from this training between 2015 and 2020.<sup>34</sup>

MCSC's Northern training programs are project-specific and all their trainers are local journeypersons who understand Indigenous communities. MCSC contacts First Nations to learn about upcoming construction work and then builds a custom training program based on short, stackable,<sup>35</sup> competency-based courses that deliver the skills needed for that project. They then liaise with contractors to link them to newly skilled graduates. For example, where a First Nation has housing plans, MCSC may start a cohort of about 20 learners aged 18 to 30 in the three-week Job Readiness Certificate.<sup>36</sup> The best graduates will be selected to take a 12-week Framer Certificate, with practical training provided by building a small house in the community.<sup>37</sup> Learners can borrow iPads pre-loaded with software to help upgrade their math and other skills.

After the course, graduates have the option to move up to a Level 1 carpentry training course at the University College of the North, the first step toward the full four-year Red Seal certification as a carpenter.



36 MCSC, "Job Readiness Program."37 MCSC, "Framer Certificate."

34 MCSC, "Indigenous Community Programs 2015–2020."

35 Stackable credentials are short courses that can be accumulated towards a higher certification.



# **Enhancing First Nations Participation in the Mining Sector**

There is increasing pressure on Indigenous communities to form partnerships and agreements with large corporations pursuing natural resource development opportunities in their territories. In response, these communities are making sophisticated cost/ benefit analyses before they consent to mineral development. The benefits of short-term job training for their members remain attractive, but communities are also interested in active decisionmaking and management of their resources. That requires a different skill set and a longer time frame.

Companies that need the consent of local Indigenous communities to move forward with mining projects should engage early and talk directly with the community.<sup>38</sup> Helping local learners from remote communities develop job skills can be a multi-year process. While still in the permitting process, Alamos Gold is already implementing a suite of projects to build skills for youth from Marcel Colomb First Nation in Lynn Lake. They hope to have these young people ready for some of the jobs that should be available when the mine goes into operation later this decade.<sup>39</sup>

The training at Lynn Lake was given a valuable kick-start by the Manitoba Mineral Development Fund. The Fund has \$20 million for projects to increase Indigenous partnerships with the mineral development industry, including access to education and skills development. In 2019, the Manitoba government also committed a modest half-million dollars towards First Nations involvement in mining though the Manitoba–First Nations Mineral Development Protocol. Enhanced community participation, including Indigenous capacity-building to support consultation, coordination, and economic development, is a priority of the Protocol and a major part of enabling meaningful participation in mining projects.

38 Liskowich, "The Benefits of Engaging Stakeholders."

39 Thompson Citizen, "Gold Mining Company, First Nation Training."

# Learning About Mining Through Virtual Reality

Virtual reality (VR) applications can be an entry point to experience the mine workplace and get a feel for the latest technology in remote mining operations.

Winnipeg's Bit Space Development Ltd. are experts in creating interactive VR training products for industry clients. With funding from the Community Economic Development Fund (CEDF) and coordination from the Northern Manitoba Sector Council (NMSC), Bit Space has captured 360-degree digital images that can be viewed through VR goggles, and they are designing multiple interactive experiences around these images.

VR goggles can be taken to remote Northern schools and career fairs to help Indigenous students get their first experience of an underground workspace and learn about the different mining occupations and the tools and equipment used. For new hires, the virtual immersive environment can be used during onboarding, introducing new workers to on-the-job regulations and protocols. And it can be used to create cutting-edge training, such as simulating a hazardous workspace, so that safety training can be realistic, low-risk, low-cost, and engaging.<sup>40</sup>

40 Bit Space Development, "Creating a Virtual Reality Safety Experience."



"A lot of people who apply for positions in these trainings would probably do very well. But they don't show well on paper because filling out forms, that's not something they do every day ... it gets frustrating .... they don't have that paper trail. Most of them, you're lucky if you get a full resumé. These are the kind of challenges we have to work with."

April Wastecicoot, Administrative Assistant, Northern Manitoba Sector Council

# **Lessons for Other Northern Mining Regions**

People and organizations across the Northern Manitoba skills ecosystem are committed to helping learners get the skills necessary for current jobs. Looking five to 10 years into the future is complicated by an economy dominated by long-term mining cycles that are outside local control. Some experiences from this Northern region may resonate with other regions where mining offers opportunities for Indigenous communities.

## **PSE Needs to Lead With the Long View**

As the only PSE institution located in the region, UCN is under pressure to expand its mandate beyond education and training to act as a neutral, apolitical hub that helps drive the future economy of the North.

## **Getting Learners Ready for Training**

In remote Northern communities, some youth may need to address trauma and addictions before they can fully benefit from skillsbuilding opportunities. Culturally appropriate mental health and wellness programming, such as land-based training connected to culture and ceremonies, can help build their confidence and motivation. Such wellness programs may be a prerequisite for success in Essentials Skills training in the nine basic skills needed for the workplace.<sup>41</sup> While some employers are supporting wellness programming in communities, basic health and education are government responsibilities. Federal, provincial, and Indigenous governments need to ensure that infrastructure and programs are available to get young people in all communities ready for industry-specific training.

41 Government of Canada, "Learn about the Skills."



## **Employers Need to Take the Long View on Local Talent Development**

Just as mine projects take many years to develop, building the skills of potential mine workers requires more than a six-month outlook. Skills development initiatives have to gradually bring learners from remote communities up to the standards needed on the work site. Companies need to engage early and stay the course over several years if they want to attract and retain a local workforce.

## **Building the Ladder Into STEM**

Too many workers in Northern Manitoba, including high school graduates, have low literacy and numeracy levels that limit their potential to move into trades, management, and STEM fields. Access programs have a proven track record in helping Indigenous learners upgrade their STEM skills and move into post-secondary studies. (See Indigenous STEM Access Programs: Leading Post-Secondary Inclusion.) The University of Manitoba's Engineering Access Program (ENGAP) has more than 20 years of experience helping Indigenous students move into STEM studies. But few Northern learners have passed through ENGAP. Provincial support for a complementary STEM bridging program located in the North could kick-start more Northern learners moving into STEM studies in all post-secondary institutions in Manitoba.

## **Coordination and Trust Go Hand-in-Hand**

Historically, there has been a low level of trust between resource development companies and Indigenous communities. Skills development programs are one way mining companies like Hudbay, Vale, and Alamos Gold are working to build community trust while preparing Indigenous workers for new opportunities. But layoffs rapidly erode that trust. Skills coordination bodies like NMMA can provide a neutral ground for employers and community representatives to meet and develop a realistic shared vision of the future.



# "We need to be thinking about how we build the University College of the North and the work that we do within the North to future-proof ourselves so that we're not lagging behind."

Rob Penner, Associate Vice-President, Community and Industry Solutions, UCN

## **Recognize Skills Contribute to Self-Determination**

Training providers need to think beyond the immediate use of practical skills as they design their courses. Skills development can contribute to future Indigenous self-determination and prosperity. NMMA courses that introduce exploration, prospecting, and mining provide a strong background for future leaders who will make policy for natural resources management on their traditional lands. Whether or not the trainee has a long-term career in mining, their understanding of the industry will be valuable to their community in the future, when outside companies come looking for minerals in their territory.



## **Rotational Work Is a Future Skill**

Rotational workers need flexibility to thrive during uncertain mining cycles. But skills development programs also need to prepare workers for the social impacts that rotational work can have on personal and family dynamics. Workers who are far from home, and potentially isolated, need to learn how to build new supportive relationships and maintain long-distance ones. Training like that arranged by NMSC aims to help new miners – especially miners and families from remote Indigenous communities – learn to juggle work, studies, and family responsibilities, have productive conversations, and promote good mental health.<sup>42</sup>

## **Succession Planning for Ecosystem Leaders**

In regions like Northern Manitoba, even the most successful skills ecosystems are at risk when there is no active succession planning or backup leaders. If the key people who embody the relationships between organizations retire or move on, the strength of the whole ecosystem can be affected. Active mentoring of future leaders is essential to ensure stable succession into the future.



42 Saxinger and Gartler, The Mobile Workers Guide.



# Appendix A Methodology

The findings presented in this primer are drawn from:

- a review of more than 250 academic and grey literature sources on sectoral change and skills development systems across Canada, and in the North;
- 13 interviews conducted during the fall of 2020 and winter 2021 with people from Manitoba who have an interest in Northern skills development ecosystems. All interviews were recorded, transcribed, and coded using qualitative data analysis software. Interview participants were associated with:
  - Cross Lake First Nation
  - Engineering Access Program, University of Manitoba
  - Frontier Collegiate Institute, Frontier School Division
  - Hudbay Minerals Inc.
  - Manitoba Construction Sector Council
  - Northern Manitoba Mining Academy, University College of the North
  - Northern Manitoba Sector Council
  - Vale S.A.
  - Yamana Gold Inc.

## Appendix B-Exhibit 1

# **Building Skills in Northern Manitoba: The Ecosystem**



## Appendix B-Exhibit 1 (cont'd)

# **Building Skills in Northern Manitoba: The Players**



# Learners with different experiences

- Indigenous and non-Indigenous
- Urban and rural
- On-reserve and off-reserve
- Any gender identity
- Any beneficiary status
- Families
- · Communities, etc.



### Post-secondary education institutions

• University College of the North, Partners: Assiniboine Community College, U Winnipeg, Brandon U, Red River College, U of Manitoba.

### Non-profit

Workplace Education Manitoba

First Nations ISET Program sub-agreement holders

Public school divisions • Frontier, Mystery, Kelsey, Flin Flon

#### **First Nations education authorities**

• 26 Band-operated schools, Manitoba First Nations Education Resource Centre Inc. (MFNERC)

### Industry sector councils

 Manitoba Heavy Construction Association, Manitoba Construction Sector Council, etc.

Traditional knowledge keepers

Elders



#### Indigenous governments

- Manitoba Keewatinowi Okimakanak (MKO)
- Keewatin Tribal Council
- Swampy Cree Tribal Council
- Island Lake Tribal Council
- Manitoba Metis Federation
- Assembly of Manitoba Chiefs

### **Provincial government**

- Manitoba Skills and Employment
   Communities Economic Development Fund/
   Look North
- Manitoba Mineral Development Fund

### Federal government

- ISC/CIRNAC
- ESDC, etc.

#### Industry associations

 Construction Safety Association of Manitoba, etc.



### Indigenous-owned enterprises

 Artic Gateway Group, LP., Churchill; Lajambe Enterprises Ltd., The Pas; Playgreen Development Corporation, Norway House; etc.

### Mining companies

- exploration and development companies such CanNickel Mining Ltd., Rockcliff Metal Corp., Alamos Gold, and Callinex Mines
- production companies such as HudBay Minerals and Vale
- service companies, such as diamond drilling companies

### Unions

• United Steelworkers, MB Building Trades Association, etc.

All kinds of other **public and private employers** 

Coordination bodies

### Bringing the players together

Northern Manitoba Sector Council
Northern Manitoba Mining Academy
Mining Industry Human Resources Council

## Appendix B-Exhibit 2

# **Phases of the Mineral Development Cycle**

Stage	Prospecting	Discovery	Development	Production	Reclamation
Length of stage	5–10 years	5 years	5–10 years	10–20 years	2–10 years+
Some typical occupations	<ul> <li>Prospector</li> <li>Line cutter</li> <li>Driller</li> <li>Geologist</li> <li>Field assistant</li> <li>Camp staff</li> <li>Transport truck driver</li> </ul>	<ul> <li>Environmental coordinator</li> <li>Geographic information systems technician</li> <li>Geological technician</li> <li>Geophysicist</li> <li>Logistics coordinator</li> </ul>	<ul> <li>Surveyor</li> <li>Engineer</li> <li>Mining technician</li> <li>Millwright</li> <li>Geological engineer</li> <li>Trades</li> <li>Power systems operator</li> </ul>	<ul> <li>Mine manager</li> <li>Miner</li> <li>Pit operator</li> <li>Health and safety coordinator</li> <li>Material handler</li> <li>Blaster</li> <li>Heavy equipment operator and mechanic</li> <li>Lab technician</li> <li>Engineer</li> <li>Truck driver</li> <li>IT specialist</li> <li>Cook</li> <li>Security guard</li> </ul>	<ul> <li>Civil engineer</li> <li>Water sampler</li> <li>Environmental monitor</li> <li>Environmental specialist</li> <li>Water sampler</li> <li>Tree planter</li> </ul>
MB examples		Corazon at Lynn Lake	Rockliff Metals Corp. Bucko Lake Mill, Wabowden	Hudbay Minerals, Snow Lake mine Vale S.A., Thompson mine	Strilkiwski Contracting Ltd. at Ruttan Mine

Sources: The Conference Board of Canada; Look North, Manitoba – First Nations Mineral Development Protocol; Mining Journal, "Lynn Lake the Next Major Nickel Sulphide Discovery?"; Government of Manitoba, "Remediation of Abandoned Ruttan Mine Underway."



# The Skills Ecosystem for Miners

# **Underground Production and Development Miners**

(NOC 8231, skill level B)



# **Building Skills for Miners**

The Northern Manitoba Mining Academy (NMMA) coordinates with mining companies, education providers, and local First Nations to deliver job readiness training for cohorts of Indigenous miners. A three-month program covers life skills, essential skills, and mining skills. Indigenous mentors support trainees as they get used to the mining work life.

But when mining companies invest in train-to-hire courses like this, they want to retain those trainees, which hasn't always worked out. Many Indigenous recruits are first-generation miners. The unfamiliar rotational lifestyle can be daunting as they leave family for long shifts at the mine. Provincial policy on mine development also affects the demand for miners and training. Permitting processes in Manitoba are slower than in other provinces, so some exploration companies are taking their investment and training dollars elsewhere.<sup>1</sup> Meanwhile, employers and unions may cooperate to transition laid-off workers to new occupations as producing mines scale down. NMSC also helps laid-off mine workers find other jobs.

1 Masson, "Message from the MSPDA President."



## **Building Skills for Mine Managers**

UCN offers a business administration program, but no university in Manitoba offers mining or geological engineering, so aspiring engineers must leave the province to study if they want to enter management through a mining engineering background. At the same time, the small pool of mine employers may create a bottleneck for developing related supervisory and management experience. Targeted programs for Indigenous leadership training, combined with experience in community management, could provide management skills that may be transferred into mining. For example, AFOA Canada partners with provincial CPA bodies to deliver transferable financial management training.



## **Building Skills for Mechanics**

The Province of Manitoba has given specific colleges responsibility for trades training. UCN can provide level 1 training for mechanics, but levels 2, 3, and 4 must be delivered in partnership with Assiniboine Community College. Employers want new mechanics immediately, but UCN can't always partner for training quickly.

Since December 2020, journeypersons may supervise two apprentices, rather than one. However, there are still few journeyperson mechanics, especially Indigenous ones, in the North. Even if they find a local journeyperson, apprentices from small communities must still leave home for coursework in Thompson or The Pas, which can be a big change for them. In 2014, NMSC worked with Manitoba Hydro to bring learners from small communities who were missing high school diplomas to Thompson to train in four trades.<sup>2</sup> The program helped them upgrade essential skills and arranged for coursework and placements with journeypersons in town, and a case manager helped find solutions for any personal issues. As a result, at least 11 new tradespeople are now working.

2 Governent of Manitoba, "Province, Manitoba Hydro Launch Northern Trades Training Program."

## Appendix D

# **Indigenous Participation in Mining Occupations**

### Table 1

Indigenous Participation in the Top 26 Mining-Related Occupations in Northern Manitoba (2016 census), With National 5- and 10-Year Outlook

(workers aged 25-64)

Occupations	NOC skill level	5-year outlook	10-year outlook	Total workers	Indigenous identity	First Nations (North American Indian)	Métis	Non-Indigenous identity	% Indigenous
6733 Janitors, caretakers and building superintendents	D	Poor	Fair	1,130	955	895	60	170	85
6541 Security guards and related security service occupations	D	Fair	Good	750	655	645	15	90	87
4212 Social and community service workers	В	Excellent	Excellent	625	535	500	40	85	86
7271 Carpenters	В	Very poor	Very poor	625	515	485	25	110	82
8231 Underground production and development miners	В	Fair	Fair	620	200	110	85	420	32
7511 Transport truck drivers	С	Fair	Good	540	360	305	55	180	67
1411 General office support workers	С	Very poor	Very poor	505	320	270	45	185	63
6322 Cooks	В	Poor	Fair	495	340	310	25	155	69
7611 Construction trades helpers and labourers	D	Fair	Good	480	415	360	50	70	86
7521 Heavy equipment operators (except crane)	С	Fair	Good	420	305	260	35	120	73
1241 Administrative assistants	В	Very poor	Very poor	420	275	210	50	140	65
7311 Construction millwrights and industrial mechanics	В	Poor	Fair	290	70	40	25	230	24
1221 Administrative officers	В	Fair	Good	285	185	150	25	105	65
1431 Accounting and related clerks	С	Very poor	Very poor	215	135	110	20	80	63
8221 Supervisors, mining and quarrying	В	Fair	Fair	205	60	25	40	145	29

(continued ...)

### Table 1 (cont'd)

Indigenous Participation in the Top 26 Mining-Related Occupations in Northern Manitoba (2016 census), With National

### 5- and 10-Year Outlook

(workers aged 25–64)

Occupations	NOC skill level	5-year outlook	10-year outlook	Total workers	Indigenous identity	First Nations (North American Indian)	Métis	Non-Indigenous identity	% Indigenous
7321 Automotive service technicians, truck and bus mechanics and mechanical repairers	В	Fair	Fair	200	110	95	10	90	55
8614 Mine labourers	В	Fair	Fair	165	65	40	30	100	39
7452 Material handlers	С	Poor	Fair	155	85	75	10	75	55
0714 Facility operation and maintenance managers	А	Poor	Fair	155	70	55	15	85	45
1311 Accounting technicians and bookkeepers	В	Fair	Good	150	80	65	15	70	53
9243 Water and waste treatment plant operators	В	Fair	Fair	145	115	95	15	25	79
7251 Plumbers	В	Poor	Fair	135	115	95	10	20	85
7312 Heavy-duty equipment mechanics	В	Fair	Good	130	45	35	15	85	35
7302 Contractors and supervisors, heavy equipment operator crews	В	Poor	Fair	130	95	80	10	40	73
7237 Welders and related machine operators	В	Poor	Fair	130	40	20	20	85	31
8411 Underground mine service and support workers	С	Very poor	Very poor	130	35	25	10	95	27
7242 Industrial electricians	В	Fair	Good	110	25	10	10	85	23
7241 Electricians (except industrial and power system)	В	Fair	Good	105	70	65	0	35	67
Totals				9,445	6,275	5,430	765	3,175	66

Sources: The Conference Board of Canada; Statistics Canada; Mining Industry Human Resources Council; OpportuNext.

# Appendix E Bibliography

Bit Space Development. "Creating a Virtual Reality Safety Experience." PowerPoint presentation at the Safety Services Manitoba Occupational Health and Safety Conference, Winnipeg, MN, November 2020. https:// safetyservicesmb-6p.mydev.ca/wp-content/uploads/2020/11/BSD-Presentation-002.pdf.

Canadian Radio-Television and Telecommunications Commission. *Communications Monitoring Report.* Ottawa: CRTC, December 10, 2020. Accessed July 30, 2021. https://crtc.gc.ca/eng/publications/reports/ policyMonitoring/2020/cmr4.htm#a2.3.

Government of Canada. "Learn about the Skills." Accessed July 30, 2021. https://www.canada.ca/en/services/jobs/training/initiatives/skills-success/understanding-individuals.html.

Government of Manitoba. "Province, Manitoba Hydro Launch Northern Trades Training Program." News release, May 23, 2014. Accessed July 30, 2021. https://news.gov.mb.ca/news/index.html?item=31069.

-. "Manitoba's Mineral Industry, Manitoba Mineral Sector Profile." Accessed July 30, 2021. https://www.gov.mb.ca/iem/industry/sector/ mines.html.

-. "Remediation of Abandoned Ruttan Mine Underway." News release, March 1, 2021. Accessed July 30, 2021. https://news.gov.mb.ca/news/ index.html?item=50890&posted=2021-03-01.

Graham, Ian. "Elimination of Nearly 150 Jobs at Vale a 'Punch in the Stomach for Thompson.'" *Thompson Citizen*, October 29, 2020. https://www.thompsoncitizen.net/news/thompson/elimination-of-nearly-150-jobs-at-vale-a-punch-in-the-stomach-for-thompson-1.24230100.

Gresch, Darren. *Responding to Automation: How Adaptable Is Canada's Labour Market?* Ottawa: The Conference Board of Canada, 2020. https://www.conferenceboard.ca/e-library/abstract.aspx?did=10626. Indigenous Services Canada. "First Nations in Manitoba." Accessed July 30, 2021. https://www.sac-isc.gc.ca/eng/1100100020400/1616072911150.

Liskowich, Mark. "The Benefits of Engaging Stakeholders–Before You Think It's Necessary." *Northern Prospector* 2019–2020, 52. Accessed July 30, 2021. https://www.srk.com/en/publications/the-benefits-ofengaging-stakeholders-before-you-think-its-necessary.

Look North. Look North Report and Action Plan for Manitoba's Northern Economy. Winnipeg: Look North, 2017. Accessed July 30, 2021. https:// www.gov.mb.ca/asset\_library/en/looknorth/look-north-report.pdf.

-. *Manitoba - First Nations Mineral Development Protocol, Co-Chairs' Report: Findings and Recommendations.* Winnipeg: Look North, 2018. Accessed July 30, 2021. https://www.gov.mb.ca/iem/mines/co-chairsreport-on-the-manitoba-first-nations-mineral-development-protocol.pdf.

-. North Region Economic Profile. Winnipeg: Look North, 2018. Accessed July 30, 2021. https://www.gov.mb.ca/jec/ecprofiles/pdfs/ecprofiles/north\_ep\_2021.pdf.

Look North, Manitoba Keewatinowi Okimakanak Inc., and Rural Development Institute. *Look North Indigenous Economy Report: Contributions of Northern Indigenous People to the Manitoba Economy.* Brandon: Rural Development Institute, 2019. Accessed July 30, 2021. https://www.brandonu.ca/rdi/files/2019/04/Look-North-Ind-Econ-FINAL-compress.pdf.

Manitoba Construction Sector Council (MCSC). "Framer Certificate." Accessed July 30, 2021. http://mbcsc.com/wp-content/uploads/ 2020/11/Framer-certificate\_update\_002.pdf.

 -. "Indigenous Community Programs 2015–2020." Accessed July 30, 2021. https://mbcsc.com/wp-content/uploads/2021/01/Indigenous-Programs.pdf. -. "Job Readiness Program." Accessed July 30, 2021. http://mbcsc.com/ wp-content/uploads/2020/06/Job-Readiness-Program\_update\_003\_ compressed.pdf.

 -. "MCSC Micro Courses." Accessed July 30, 2021. http://mbcsc.com/ training/mcsc-micro-courses/.

Manitoba Public Insurance. "Remote Area Registrations." Accessed July 30, 2021. https://www.mpi.mb.ca/Pages/remote-registrations.aspx.

Marshall, Brendan. *Facts and Figures 2020: The State of Canada's Mining Industry.* Ottawa: The Mining Association of Canada, 2021. Accessed July 30, 2021. https://mining.ca/wp-content/uploads/2021/02/FF-2020-EN-Web.pdf.

Masson, Stephen. "Message from the MSPDA President." Northern Prospector 2019–2020, 8–13.

Mining Industry Human Resources Council (MiHR). *COVID-19 and Labour Market Volatility in Canada's Mining Industry.* Kanata: MiHR, March 2021. Accessed July 30, 2021. https://mihr.ca/wp-content/uploads/2021/03/ MIHR-Covid-19-Labour-Market-Volatility-Report-E-web.pdf.

-. *Guide for Aboriginal Communities*. Kanata: MiHR, 2015. Accessed July 30, 2021. https://mihr.ca/wp-content/uploads/2020/03/ MIHRGuidetoAboriginalCommunities.pdf.

-. *Mining Year in Review: National Outlook 2021.* Kanata: MiHR, March 2021. Accessed July 30, 2021. https://mihr.ca/wp-content/ uploads/2021/03/MIHR-National-Outlook-LMI-Report-2021-E-web.pdf.

-. The Changing Nature of Work: Innovation, Automation and Canada's Mining Workforce. Kanata: MiHR, May 2020. Accessed July 30, 2021. https://mihr.ca/wp-content/uploads/2020/05/MIHR\_Innovation\_Report\_EN\_WEB.pdf. Mining Journal. "Lynn Lake the Next Major Nickel Sulphide Discovery?" *Mining Journal*, February 17, 2021. https://www.mining-journal.com/ resourcestocks/resourcestocks/1404974/lynn-lake-the-next-major-nickel-sulphide-discovery.

Parizot, Matthew. "Hudbay Aims to Double Gold Production at Lalor Mine." *CIM Magazine*, March 31, 2020. https://magazine.cim.org/en/news/2020/hudbay-aims-to-double-gold-production-at-lalor-mine-en/.

Saxinger, Gertrude, and Susanna Gartler. *The Mobile Workers Guide: Fly-in/Fly-out and Rotational Shift Work in Mining. Yukon Experiences.* Whitehorse: ReSDA, First Nation of Na-Cho Nyak Dun, and Yukon College, 2017.

Statistics Canada. Table 14-10-0023-01. Labour Force Characteristics by Industry, Annual (x 1,000). Accessed July 30, 2021. https://www150. statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410002301.

Census Profile, North [Economic region], Manitoba and Manitoba
 [Province] (table). 2016 Census. Catalogue no. 98-316-X2016001.
 Accessed July 26, 2021. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E.

Thompson Citizen. "Gold Mining Company, First Nation Training Indigenous Youth Near Lynn Lake with Help from Province." *Thompson Citizen*, December 15, 2020. Accessed July 30, 2021. https://www. thompsoncitizen.net/news/nickel-belt/gold-mining-company-firstnation-training-indigenous-youth-near-lynn-lake-with-help-fromprovince-1.24255445.

-. "UCN Total Headcount Enrolment Continues to Establish New Record Highs." *Thompson Citizen*, April 8, 2019. https://www.thompsoncitizen. net/news/thompson/ucn-total-headcount-enrolment-continues-to-establish-new-record-highs-1.23784132.

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