Evaluation of the Centre for Northern Innovation in Mining

Findings Synthesis

Submitted to:
CNIM Evaluation Steering Committee

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Introduction

Yukon College's Centre for Northern Innovation in Mining (CNIM) was created in 2013 to provide entry level training, trades training and technical training for the Yukon mining industry. The Centre was created in response to an expansion in the Yukon's mining sector which peaked in 2012 when three hard rock mines were in operation. Founded in close co-operation with the territory's government and business leaders, CNIM has delivered innovative and flexible employment and career training well-matched to Yukon labour-market needs in an effort to facilitate workforce growth in Yukon communities proximate to mining activity. In collaboration with the Yukon Research Centre, CNIM also conducts applied research to strengthen and improve the competitiveness of Yukon's mining sector and its environmental sustainability. CNIM's goal is to help build a highly skilled northern workforce, a stronger economy through greater opportunity, and a more efficient, sustainable mineral industry.

The Centre for Northern Innovation in Mining provides services to industry and training for students with state-of-the-art facilities, mobile classrooms and high-tech simulators. CNIM training will allow Yukon residents, and individuals wanting to live and work in Yukon, access to nationally recognized learning opportunities customized for northern economic and environmental circumstances. CNIM operations are guided by a Governing Council which provides vision, leadership and strategic direction on specific mining industry training needs, both in the short-term and in the future. The Council is comprised of 15 representatives drawn from industry, the education sector and First Nations and meets quarterly. The majority of Council members represent Yukon's mining industry.

This report presents the findings of an evaluation of the Centre for Northern Innovation in Mining's first three and a half years of operations. The evaluation was undertaken between November 2016 and March 2017 by Vector Research, in collaboration with Westropp Management Consulting. The evaluation describes the activities undertaken, assesses the quality of outputs produced, examines the extent to which the intended outcomes of CNIM are being achieved and provides recommendations for program improvements. The evaluation was conducted in accordance with the logic model (shown on the following page) and evaluation plan developed for CNIM by Vector Research in 2015. Multiple lines of evidence were used to generate quantitative and qualitative data for the evaluation, including:

- a review of available administrative documents including governing council minutes and briefing notes;
- a review of the Yukon College – Yukon Government Transfer Payment Agreement;
- a review of Operations and Maintenance Activity and Financial Reports and Planning Reports; and,
- face-to-face and telephone interviews with key informants and students (n=34):
    - CNIM staff (n=8);
    - members of CNIM's Governing Council (n=5);
    - employers and mining industry stakeholders (n=10);
    - CNIM students (n=11).

Centre for Northern Innovation in Mining (CNIM) – Logic Model

Vector Research

rev.7

Inputs

Activities undertaken at the Centre for Northern Innovation in Mining are funded through a $10 million appropriation from the Yukon Government spread over five years. Fifty-five percent ($5.5 million) of the $10 million appropriation was allocated to operating expenses and the remaining 45% ($4.5 million) was allocated to capital expenses. A separate $1.1 million appropriation from the Yukon Government was used to purchase the mobile trades training trailer. The Government of Canada, through the Canadian Northern Economic Development Agency, also provided $5.6 million in capital funding for CNIM.

CNIM Funding from Yukon Education

2013/14	$672,191
2014/15	$2,175,525
2015/16	$3,600,988
2016/17	$2,323,487
2017/18	$1,200,000
Total	$9,972,191
Annual Average	$1,994,438

Source: Yukon College and Yukon Education (Transfer Payment Agreement).

The Centre's Executive Director is assisted by administrative and course support staff from Yukon College and course delivery is performed by a variety of Yukon College faculty and, as required, sessional instructors. Yukon College provides several in-kind supports to CNIM including facility space at the Ayamdigut Campus as well as Yukon College campuses located in communities throughout the Yukon. Yukon College also provides accreditation opportunities for CNIM courses and access to Yukon College's administrative, financial and human resources centralized systems.

Governance support and guidance is received from a Governing Council comprised of representatives from the mine exploration, development and production sector (minimum six members) as well as representatives from Yukon College (President), Yukon First Nations (Chiefs) and the Yukon Government (Deputy Minister of Education and the President /CEO of the Worker's Compensation Health and Safety Board).

Activities

Six distinct activities are undertaken at the Centre for Northern Innovation and Mining on an ongoing basis. As described below, all activities have been completed as planned.

Student registration, preparation and student support.

Recruitment and registration of CNIM students is fully integrated with Yukon College's Admissions Office at the Ayamdigut campus. Courses are advertised on Yukon College's website, at Yukon College's 11 community campuses as well as in local newspapers. Academic and counselling support is available to CNIM students through existing Yukon College services.

Additional life skills training and career planning are offered in collaboration with the Yukon Mine Training Association. Founded in 2004 as a link between Yukon First Nations and Yukon's mining and resource-related industries, YMTA offices are now co-located in the CNIM building. Overseen by an independent board, YMTA continues to provide direct funding to eligible CNIM students.

Industry-led, market-sensitive and Yukon-specific course selection, development and delivery.

The CNIM Executive Director and Yukon College faculty, in collaboration with mining industry representatives on the CNIM Governing Council, monitor the labour-related needs and requirements of companies active in the exploration, extraction and support services areas of the Yukon mining industry. Courses are selected for development on the basis of current industry market conditions, the unique challenges faced by companies operating in the Yukon, and skills gaps identified in the Yukon labour market. Examples of CNIM's responsiveness to industry and community training needs include the development and delivery of the Rotary Air Drilling Program, the Environmental Monitoring Program and Introduction to Trades seminar.

Support for instructors that enables innovative and responsive course delivery.

Staff interviewed for the evaluation indicated receiving excellent support to undertake course-based professional development, both in terms of skill-specific opportunities (e.g., water quality training, career counselling) as well as credentialed opportunities (e.g., Masters in Education). CNIM faculty and staff confirmed a high level of support for direct interaction with mining industry companies and representatives through participation in the Yukon Geoscience Forum in Whitehorse and the Cordilleran Round-up in Vancouver.

Delivery of the Geological Technology Diploma program also provides an avenue for faculty and sessional instructors to interact directly with industry through organization and implementation of hands-on geology research projects at Yukon exploration sites. For example, CNIM instructors and students undertook a three day field school at the Casino property in 2013. CNIM instructors have also been encouraged to collaborate with other post-secondary institutions such as the Delta Mine Training Centre in Delta Junction, Alaska.

Identification of Yukon-specific mining constraints for solving by the Yukon Research Centre.

An application to the Natural Sciences and Engineering Research Council of Canada (NSERC) for an Industrial Research Chair was made by Yukon College at the same time as business planning for CNIM was underway in 2012. An IRC position was established at the Yukon Research Centre in 2013 with the stated objective of developing research leadership to address challenges and opportunities specific to the north within the mining industry. Two streams of applied research were identified for investigation by the Chair: management and treatment of mine-influenced water and terrestrial reclamation practices.

To ensure close alignment between the research needs of industry and CNIM and the objectives of the Yukon Research Centre, a reporting relationship has been established between CNIM's Executive Director and the Industrial Research Chair. The Chair has also been a regular participant in Governing Council meetings. As part of the development of an application to extend the Industrial Research Chair position beyond 2017, the Yukon Research Centre consulted extensively with CNIM's Governing Council.

Example of projects completed or underway at the Yukon Research Centre with application to the Yukon mining industry include:

- Fine Gold Gravity Concentrate Upgrading;
- Heavy Metal Removal by Bio-remediation;
- Reduction of Contaminant Buildup in Recycled Process Water;
- Hydrocarbon Bioremediation;
- Borehole Drill Advancements;
- Drilling Water Heater and Pump;
- Mine Restoration with Biochar; and,
- Mining and Transportation Sectors Adapting to Climate Change.

CNIM facility planning, design and construction; lab and shop outfitting.

A flagship feature of the Centre for Northern Innovation in Mining is its new purpose-built learning facility. A CNIM building advisory committee was established in late 2013. A tender for a functional plan for the new facility was tendered in early 2014 and the design for the new CNIM building was tendered in June 2014. The construction tender was issued in February 2015 and the contract for construction was tendered in May 2015. Building construction was completed in September 2016. Located adjacent to the trades wing at Yukon College, the CNIM facility houses two mechanical shops for industrial teaching as well as classrooms, offices and other service spaces.

Preparation of institutional documents: budgets and performance reports.

A variety of institutional documents are prepared and submitted to CNIM funders:

- CNIM Project Plan (annual);
- Activity reports on planned and delivered courses (quarterly);
- Financial Report - Operations and Maintenance (quarterly);
- Financial Report – Capital (quarterly); and,
- Capital Activity Report (quarterly).

Outputs

Activities undertaken by Centre for Northern Innovation in Mining staff culminate in the delivery of a series of four outputs. An assessment of the production and quality of the four outputs follows below.

Approved and accredited supply of industrial and trades-related education and training with an appropriate balance between general trades and mining trades.

All credited CNIM course offerings are approved by Yukon College's Academic Council, and non-credit programs are reviewed by industry to ensure they uphold industry-specific competencies. The focus of CNIM's education and training efforts is on industrial and trades-related occupations which are in demand by mining sector businesses operating in the Yukon. It is also intended that the delivery of education and training by CNIM be appropriately balanced between mining courses and mining trades-related occupations such that students graduating from CNIM courses and programs may find employment at all stages of the mining cycle.

Courses delivered by the Centre for Northern Innovation in Mining are listed in the table below. A total of 36 courses and labs were delivered in the Geological Technology Diploma program. Additional mining-focused course content was delivered in the form of three drilling technician courses, two environmental monitoring courses and two surface / underground mining courses.

Courses in mining trades-related occupations were also delivered through CNIM from the launch of CNIM programming in 2013 to December 2016. Seven welding technician and 14 heavy equipment technician course were delivered. Augmented enrollment in the heavy equipment technician program has opened a window to offer level 3 of the program. Two skills for employment courses have also been offered in collaboration with the Yukon Mine Training Association.

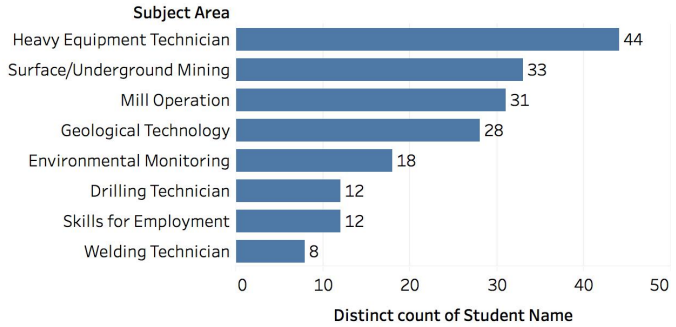
CNIM Course Delivery from CNIM Launch to December 2016 (T2 2013 to T2 2016)

Geological Technology Diploma Program		Drilling Technician	Heavy Equipment Technician
• Bedrock Geology	• Mineral Economics and Law - Lab	• Applications of Drilling	• Air Brakes
• Bedrock Geology Lab	• Mineral Processing	• Drill Maintenance and Repairs	• Charging & Cranking Systems
• Capstone Research Project	• Mineral Resources Comm. & Career	• Introduction to Air Rotary	• Diesel Fuel Injection Systems
• Comm. and Career Search	• Mineralogy/Petrology	**Environmental Monitoring**	• Electrical & Electronics
• Exploration and Mine Safety	• Mineralogy/Petrology - Lab	• Environmental Monitoring	• Electronics Fuel Management
• Fund of Surveying Field Course	• Mining Computing	• Intro to Enviro Monitoring	• Engine Fund., Service & Repair
• Geochemistry	• Mining Industry Overview	**Surface/Underground Mining**	• Engine Systems
• Geochemistry - Lab	• Mining Mill Operations	• Intro to Mine Cycle	• Hydraulic Brake Systems
• Geomorphology	• Ore Deposits	• Intro to Mining Equipment	• Hydraulics
• Geomorphology Lab	• Ore Deposits-Lab	**Welding Technician**	• Powertrain (Off-road)
• Intermediate Geology Field School	• Physical Geology	• Applications of Welding	• Safety, Materials and Tools
• Intro Geology Field School	• Physical Geology - Lab	• Intro to Gas Metal Arc Welding	• Shop Projects
• Intro to Geophysics - Lab	• Rock Mechanics	• Mathematics for Welders	• Steering, Suspension, Accessor
• Intro to Hydrogeology - Lab	• Sedimentary Stratigraphy	• Oxyacetylene Welding/Faults	• Suspension, Wheels & Systems
• Introduction to Geophysics	• Sedimentary Stratigraphy - Lab	• Shielded Metal Arc Welding	**Skills for Employment**
• Introduction to Hydrogeology	• Structural Geology	• Welding Hand & Power Tools	• Essential Skills
• Introductory Field Camp	• Structural Geology - Lab	• Welding Safety	• Skills for Employment
• Mineral Economics and Law	• Underground & Surface Mining		

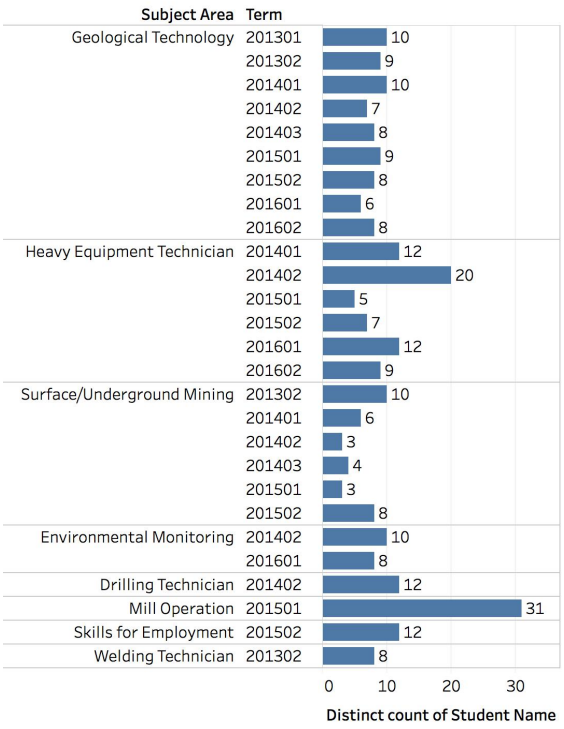
Program participants well prepared for employment in industrial and trades-related occupations, specifically mining-related occupations.

Over the first three years of operations, a total of 178 unique students have enrolled in courses delivered through CNIM. As shown in the chart to the right, 44 students enrolled in heavy equipment courses, 33 enrolled in surface / underground mining courses, 31 students enrolled in the mill operation course and 28 students enrolled in the geological technology program. Eighteen students enrolled in environmental monitoring courses, and 12 students enrolled in each of the drilling technician and skills for employment subject areas. Eight students enrolled in welding technician courses delivered through CNIM. Details of course enrollment by school term is presented in the chart below.

Number of Students by Subject Area
From CNIM Launch to December 2016
(T2 2013 to T2 2016)



Number of Students by Subject Area
By School Term - CNIM Launch to December 2016



A key aspect of CNIM's approach to producing well-prepared program graduates is to provide training as "close to home" as possible, recognizing that many students may have family and community obligations which need to be respected during a course of study. Through use of the CNIM mobile trades trailer CNIM students have been able to complete courses in the following communities:

- Beaver Creek
- Dawson City
- Mayo
- Pelly Crossing
- Ross River
- Watson Lake

In addition to periodic fieldwork, work placements and site visits, preparation of students for employment has also been encouraged through course delivery schedules as part of a partnership with the Delta Mine Training Centre in Alaska which mimics the industrial environment and shift rotation schedules of an operating mine (e.g., 2 weeks on, 2 weeks off).

Students interviewed for the evaluation were asked if they felt that their CNIM studies properly and completely prepared them for working in an industrial or trades related occupation. In general, students indicated feeling well prepared. As described by one student: "*with the field studies, fieldwork and lab we do in the program, I definitely feel that I will be well-equipped to do about variety of jobs. I was applying for a job the other day and it required a bunch of experience and knowledge and I could* check, check, check – *I was able to answer yes to everything so I think I will be well-equipped.*

CNIM brought innovation to the Yukon's drilling industry by working with Yukon drilling companies to create a standardized drilling curriculum that reflects environmental and safety best practices. By completing the new course, graduates signal to potential drilling industry employers their readiness to work at a drilling site and immediately absorb company-specific training and instruction.

On-time and on-budget construction of new CNIM facility.

The CNIM facility was opened in September 2016, four months ahead of the forecast date. Construction and outfitting of the new facility was completed within the allocated budget of $8.3 million.

Timely and well prepared institutional documents.

A review of the quarterly and annual reports produced by CNIM for Yukon Education, as well as interviews with Yukon Education officials, confirms that all institutional documents have been well prepared and on time. Better alignment of the information requested by Yukon Education and the performance monitoring data outlined in the 2015 CNIM Evaluation Plan will facilitate future CNIM evaluation efforts.

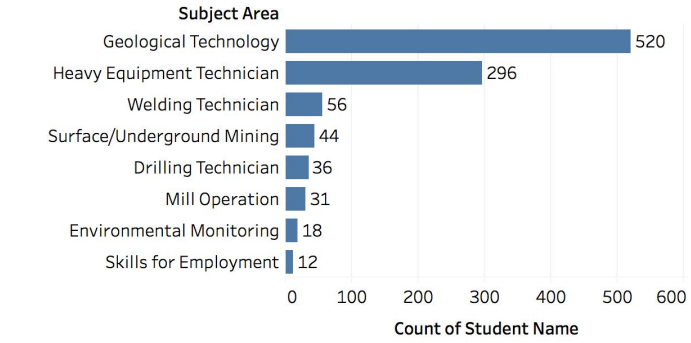
Short-term Outcomes

The outcomes presented in the logic model illustrate how the production of outputs by staff and sessional instructors at the Centre for Northern Innovation in Mining will make a difference for the Yukon mining industry, Yukoners in all Yukon communities and Yukon College in both the short-term and the long-term.

Expanded pool of qualified and employment-ready graduates in apprenticeship, industrial trades, environmental and geo-technical occupations.

CNIM has done well to expand the pool of qualified and employment-ready graduates in the Yukon over its first three years of operations. On the basis of Yukon College registration data, the total number of CNIM course enrolments from CNIM launch in late 2013 to December 2016 was 1,013. As illustrated in the chart to the right, slightly more than half of all course enrolments (520) have been in the Geological Technology Program. A further third of all course enrollments (296) were in the Heavy Equipment Technology Program. Enrollment in Surface/Underground Mining (44), Drilling Technician (36), Mill Operation (31) and Environmental Monitoring (18) courses totaled 129 from CNIM's launch in 2013 to December 2016.

Course Enrollment by Subject Area
From CNIM Launch to December 2016
(T2 2013 to T2 2016)



On the basis of data compiled by Yukon Education from quarterly CNIM administration reports, enrollment in CNIM-delivered courses totaled 308 between the launch of CNIM in late 2013 and the end of September 2016. Data from the same compilation indicates that the corresponding number of course completions was 177. As a result, the overall completion rate for CNIM courses between the launch of CNIM in late 2013 and the end of September 2016 was estimated to be 57%. The Yukon Education-compiled figures include students who were enrolled in more than one course.

Analysis of the O&M Quarterly Activity Reports submitted to Yukon Education provides some insight about the pool of graduates from the Geological Technology Diploma Program in which a certificate is granted after one year of study and diploma after two years of study. A total of seven students started the Geological Technology Diploma Program (originally named the Mineral Resources Technician program) in the winter of 2013/14. All seven students in the initial Geological Technology Diploma Program cohort completed the required first-year courses and received certificates from Yukon College. Five students completed all 36 required courses and labs and graduated from the program with diplomas in the spring of 2015.

The second cohort of eight Geological Technology Diploma Program students began their coursework in the winter of 2015. At end of the certificate year, four students received their full certificate, with the other four continuing on to complete some non-geoscience coursework. Six students were registered as full-time participants in the diploma year of the Geological Technology Diploma Program in the fall of 2016.

Students in all mine-related programs and trades training must demonstrate knowledge of Yukon occupational health and safety standards and know how to work safely. Many graduates will have obtained Red Cross Standard First Aid certification. The employment-readiness of CNIM students is supported through the provision of life skills training and career planning in parallel with CNIM studies. As noted by a student interviewee, *"…it's easy to step into a position if you're already safety aware and the employers can see that safety is your first standard…you're more likely to get the job".*

CNIM seen by labour market participants and potential entrants as the go-to portal for trades-related training in all aspects of the Yukon mining industry (exploration, extraction & support services).

A sign of success for CNIM is to be seen by potential labour market participants as a viable entry point into the Yukon mining industry. Interviews conducted with CNIM students suggest students perceive CNIM to be a very good place to begin a mining-related career:

> *"What I appreciated most were the instructors. They were knowledgeable and nice enough to put some extra time in every single day to make sure we understood everything completely."*
>
> *"It was close group of people to work with, having so few people in the class you get to know your teachers really well.*
>
> *"The field trips were very useful, for me, it led to employment, I'm now working for one of the companies where we did a field trip."*

> *"School is insulated compared to work environment. We went to the Delta Mine Training Centre two times. Lived in camp and had a better idea of working conditions…this was really helpful. We had a lot of safety training to be mindful of the way some work places are. Good to speak that language when you go into a work place."*

Data describing the number of graduates entering the CNIM program directly from high school were not available.

CNIM positioned as a one-stop-shop for all labour-related aspects of the Yukon mining industry through steady cooperation with industry, governments and the public.

On the question of whether CNIM is now positioned as the one-stop-shop for all labour-related aspects of the Yukon mining industry on behalf of all other Yukon Government and non-governmental agencies and organizations involved in mining-related skills development, respondent sentiment could perhaps be summed up as "getting there".

As noted by one respondent: "*We've solved the confusion of multiple providers. There was confusion between what YMTA did versus what the Yukon College did versus what the Northern Safety Network did. YMTA and CNIM are now totally aligned and complementary. Yukon College and the Northern Safety Network have entered into a cooperation agreement to clarify the mandates of the two organizations."*

Clearly, a strength of CNIM, as it works toward positioning itself as a one stop shop, is its partnerships with other institutions; partnerships that have greatly enhanced CNIM programming. The partnership with Delta Junction Mine Training Centre, for example, provides CNIM students with access to an underground mine where students gain 'real world' experience under safe and controlled conditions. Informal partnerships developed through the Circumpolar Innovation Network with institutions delivering similar programming promote information sharing related to current trends in mining education and have facilitated exchanges in curriculum between CNIM and other institutions. Beneficial partnerships are also emerging with the Yukon Geological Survey and Highways and Public Works. Both YGS and HPW serve as resources for CNIM students (e.g., YGS core samples library and HPW on-road machinery) and provide employment opportunities for CNIM graduates.

Consistent with the original impetus for establishing CNIM, training Yukoners to work in Yukon mines to stem the flow of fly-in, fly-out workers, the focus of CNIM programing so far has been on the mineral extraction industry. Interviews with stakeholders in the exploration and placer mining arenas confirmed that significant interest exists in expanding offerings of CNIM training to mining-related service and supply employment opportunities. As noted by a Governing Council member, not all community members want to live in a camp nor do they want to work on a rotating two-week work schedule. As jobs in the service and supply sector are less likely to involve a camp rotation schedule, more support for those types of jobs might attract more people to the mining industry. As a result, it was suggested that CNIM could expand its reach within the mining industry to include service and supply businesses.

In terms of broader public awareness of CNIM, it was suggested that more remains to be done to communicate CNIM's long-term value proposition to the public. The public may question why people are being trained for jobs in what is perceived as a boom and bust industry, yet not understand that CNIM is about outfitting people with skills and training that can help them bridge across downturns and be ready to benefit from industry upturns. As noted by a Governing Council member, "*without exception, every mining company I know would like to employ as many Yukoners as possible, it saves costs, it's good public relations. The challenge is that members of the workforce don't always have the skillset mines need – that is CNIM's role and they are doing a good job.*"

Yukon First Nations and communities inspired by the potential for people to have mining-related careers in their own back yard.

Overall, evaluation interview respondents advised that CNIM has made meaningful progress towards inspiring people in Yukon communities about the potential for mining related careers, both through enrollment in CNIM courses by students from Yukon communities, and by taking CNIM courses to the communities: "*CNIM isn't demanding that people come to Whitehorse, there is outreach and training in smaller Yukon communities with the trades trailer, it's a great initiative.*"

Outreach into Yukon communities does not always involve structured programming. For example, CNIM has offered an Introduction to Trades seminar and a pre-apprenticeship program as a means of raising awareness of different trades-related career possibilities. The hands-on, community-located exposure to the trades delivered by CNIM provides an opportunity for people in Yukon communities to more fully consider pursing the training needed to build a career in the mining-related trades. In addition, the Yukon Research Centre, in collaboration with CNIM, has worked with students in Pelly Crossing and Dawson City to look at applying remediation methods developed at the Centre to mining and exploration projects close to those communities. As a result, a new generation of young people are being exposed to the different career paths available in the mining sector as well as the education requirements for various positions.

A concern was expressed by more than one interviewee that CNIM may not yet be reaching all segments of the labour pool in Yukon communities since a lot of the skilled trades positions require a minimum of a grade 12 education. With graduation rates lower in Yukon communities than in Whitehorse, "*there is a part of the labour pool that isn't available to advance into those skilled positions*."

While it could be argued that education at the secondary level is outside the mandate of Yukon College, college-level career paths begin before the post-secondary school level. Bringing benefit to all labour market participants in Yukon communities can only be helped along by "*engaging with community members, identifying interest and upgrading skillsets with individualized learning plans.*" The concern expressed was most acute among interview participants who have an awareness of the continuing and increasing shift towards automation in the mining industry and the post-secondary skills that will be required to secure employment in the industry.

By design, CNIM has involved Yukon First Nations and community leaders in the provision of governance support and advice in an effort to help make apparent the paths that community members may follow to benefit from resource development opportunities. Several interview respondents noted that expanded First Nation representation on CNIM's Governing Council and CNIM sub-committees would increase the potential for CNIM to deliver on that intent.

Long-term Outcomes

The long-term expected outcomes for the Centre for Northern Innovation in Mining are broader than the short-term outcomes in terms of both time horizon and societal span. The long-term outcomes will take longer to achieve and are expected to have influence beyond Yukon College on the Yukon mining industry and on people in all Yukon communities.

A Yukon mining industry that benefits from a cost-efficient and stable supply of qualified and skilled industrial labour and a strengthened social license to operate.

Definitive data describing the employment outcomes of CNIM students and graduates is not available. Information from quarterly activity reports prepared by CNIM does illustrate, however, a good level of engagement between CNIM students and Yukon mining employers during the summer field season by employment of CNIM students reported at: Yukon Zinc, Capstone Mining, Aurora Geosciences, Yukon Highways and Public Works, the Yukon Geological Survey and Groundtruth Exploration.

A potential labour outcome metric is whether companies approach CNIM looking for students to hire or whether CNIM is approaching companies to hire students. It was noted that in the first couple of years CNIM operations, the program did not have companies soliciting students. By the third summer, however, several companies contacted CNIM instructors about filling positions and inquiries have already started for the summer ahead. *"Companies that have a few good interactions with local students will help this roll along, it's moving in the right direction."*

Whether CNIM activities and training efforts have strengthened the Yukon mining industry's social license to operate was summed up by one interview respondent by saying "it can only have helped, as it's an ongoing challenge for the mining industry." How it helps was described in a couple of different ways. First, it allows mining companies to be seen doing something to help steer benefits into Yukon communities during a downturn in the industry, when companies are conserving cash and keeping a low profile. And when mining activity picks up again and people are trained and ready to go to work at the time when the mines need them, the value of those efforts will be amplified.

Second, CNIM students will become ambassadors for responsible and safe mining practices. As noted by an interview respondent:

> *"The Yukon population is fairly divided. Some people see mining as our main source of income because we don't have so many other types of resource wealth. Other people move to the Yukon thinking it is the last greenspace. With research, if we can plan and have people with proper training run things properly, we can have both situations."*

Yukoners in all Yukon communities able to access fulfilling industrial and mining-related careers and consequently enabled to more fully participate in the development of Canada's north.

For Yukoners to have a fulfilling industrial and mining-related careers means being able to progress within a given field to positions of greater responsibility. A fulfilling career also means having access to work opportunities, or combinations of work opportunities, that are of sufficient length to, for example, achieve a goal of home ownership or open up the possibility of raising a family in the Yukon. By having fulfilling careers, Yukoners will consequently be enabled to more fully participate in the development of Canada's north. Of CNIM's three long-term outcomes, this outcome will require the longest time horizon to achieve. With CNIM in only its fourth year of operations it will take some time yet before progress towards achieving this outcome can be demonstrated.

Yukon College recognized as a leader in northern mining education / training and applied industrial research.

Overall, CNIM is currently seen by interview participants as an emerging leader in terms of both mine training and applied industrial research. As summed up by an employer respondent: *"CNIM is building steam, with the investment and enthusiasm behind it, I think this could be industry's best friend if we use it properly."* While some respondents pointed out that Yukon College is a leader simply by being the first and only institution in the north to offer such a package of programs, others noted that Yukon College is truly doing some things differently. One example of how CNIM is leading cited by an interview respondent is the creation of the environmental monitoring program. First Nation governments and communities brought forward a desire to have a local understanding of how the effects of mining on the environment can be tracked and responded to in real time. CNIM listened and worked together with First Nation and industry representatives to create a new offering with content specific to the north.

A second example of CNIM leadership relates to its effort to serve as a bridge between governments, agencies, organization and industry: *"CNIM has created models for partnerships that people want to replicate."* For example, the partnership with the Delta Mine Training Program has provided Yukon students with a training opportunity that allows them to *"make mistakes under safe and controlled conditions in the real-world atmosphere of an operating mine."* For companies, their partnerships with CNIM provides *"…a safe forum for industry to discuss training needs."* And those synergies create a working environment where *"…everyone involved in CNIM feels they are an agent of change."*

In terms of applied industrial research, as listed on page 5 of this report, the Yukon Research Centre has undertaken several mining-related research projects. Among the projects, Heavy Metal Removal by Bio-remediation enjoys a very high profile among evaluation interview respondents, both because it is specific to the north and because it provided evidence applicable at the permitting stage of a mining project.

While successful leadership will bolster Yukon College's efforts to become a fully accredited university, some interview participants cautioned that Yukon College needs to remember that university is not in the cards for the everyone: "*folks who want to go to university will leave their community anyway*." A focus has to remain on people who will live their whole lives in the same community.

Recommendations for Program Improvement

As outlined in this evaluation, the Centre for Northern Innovation in Mining is effectively delivering an appropriate mix of mining-related training through a collaborative, systems-thinking approach. The fundamentals for future CNIM success – state-of-the-art facilities, top-notch staff and productive partnerships – are all in place. Continued funding will ensure that Yukon College and the Centre for Northern Innovation in Mining remain well-poised to supply Yukon mining projects with qualified and skilled workers as the level of activity in the Yukon's mineral sector continues to rebound. The recommendations for program improvement presented below are intended to provide direction for how CMIM can refine aspects of its operations and continue to strive to achieve its intended outcomes:

1 Fully implement the Data Collection Guidebook contained in the 2015 CNIM Evaluation Plan to better allow CNIM to demonstrate progress towards achieving employment-related outcomes.

2 Investigate the feasibility of expanding CNIM offerings to include training for positions in the mining service and supply sector so that workers in Yukon communities who are not able to work on a rotating shift schedule can also become qualified for opportunities in the Yukon mining sector.

3 Expand the composition of the CNIM Governing Council to include broader First Nation representation from additional Yukon communities to continue to facilitate connections between industry and Yukon First Nations for purposes of labour planning and skills development.

4 In collaboration with community leaders and the Yukon Government, develop a strategy to expand CNIM's circle of influence in Yukon communities to help improve high school completion rates and the preparation of community members for training opportunities.

5 Develop a CNIM brand identity that clearly reflects both CNIM's placement within Yukon College and CNIM's extensive First Nation, community and industry connections.