MINING INDUSTRY HUMAN RESOURCES

Guide for Aboriginal Communities

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

CONSEIL DES RESSOURCES HUMAINES
DE L'INDUSTRIE MINIÈRE

A MESSAGE FROM RYAN MONTPELLIER, EXECUTIVE DIRECTOR, MiHR COUNCIL

Many of Canada's principal producing mines and active mineral exploration projects are located within close proximity of Aboriginal communities. That is just one of the factors which attract Aboriginal Peoples to companies now offering high wages, transferable skills and on-the-job training. Aboriginal Peoples not only help Canada's minerals and metals sector meet its HR needs for current and planned mining ventures, but also provide companies with new perspectives and skills.

In fact, the mining industry is the largest employer of Aboriginal Peoples in Canada. The Inuit, First Nations, and Métis have become essential elements in Canada's mining industry labour force. With a much younger demographic, they are now being presented with tremendous opportunities in mining, as well as in a variety of other sectors currently facing skills shortages. That is why a growing number of Aboriginal communities are developing relationships and partnerships with the minerals and metals sector.

The *Mining Industry Human Resources Guide for Aboriginal Communities* is one of several resources developed by MiHR in support of the continued engagement and advancement of Aboriginal Peoples in Canada's mining industry. The guide is a user-friendly tool for Aboriginal organizations interested in learning more about mining employment, as well as for those with a specific focus on developing mining-related training and employment opportunities for their communities. The guide highlights the benefits mining can bring to individuals and communities and is a complementary resource for essential skills and work readiness programs such as MiHR's *Mining Essentials* Program which help to ensure that Aboriginal peoples have the skills and confidence needed to enter the mining industry.

MiHR developed this publication with the commitment and support of a project advisory committee that represents the following organizations:

- Inuit Tapiriit Kanatami (ITK)
- Assembly of First Nations (AFN)
- Métis National Council (MNC)
- Aboriginal Human Resources Council (AHRC)
- Mining Association of Canada (MAC)
- Prospectors and Developers Association of Canada (PDAC)
- Natural Resources Canada (NRCan)
- Aboriginal Affairs and Northern Development Canada (AANDC) (formerly INAC)
- Human Resources and Skills Development Canada (HRSDC)

In presenting this guide, MiHR would also like to take the opportunity to thank all other individuals who contributed to its development.

Respectfully,

Ryan Montpellier
Executive Director
Mining industry Human Resources Council (MiHR)

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Introduction

COMMUNITY ENGAGEMENT

Labour market research has indicated that the aging of the Canadian population and mining workforce, loss of industry knowledge and lack of young people with the right skills all pose critical challenges in meeting future hiring needs across the mining industry. This means that employers will have to look to underrepresented groups to fill talent gaps.

The fact that many Aboriginal communities are located near Canada's principal producing mines and active mineral exploration projects provides an excellent opportunity for Aboriginal people to not only work in this industry but also provide services to the industry. The relatively young and growing Aboriginal population and the proximity of Aboriginal communities to many mining projects provide the mining industry with unique opportunities to source its future workforce from within these communities. This industry is one of the largest employers of Aboriginal Peoples and offers high wages, transferable skills and on-the-job training. Aboriginal Peoples not only help Canada's minerals and metals sector meet its human resource needs for current and planned mining ventures, but also provide companies with new perspectives and skills.

MiHR has undertaken a number of projects including this *Mining Industry Human Resources Guide for Aboriginal Communities*.

This guide has been developed as a resource for Aboriginal community organizations, career planners and practitioners, community leaders and individuals. For Aboriginal community organizations, career planners and practitioners, there are examples of existing training programs, highlighting some

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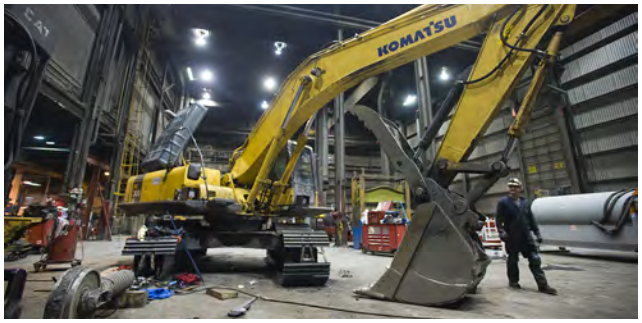
WHERE CAN I FIND INFORMATION ABOUT THE MINING INDUSTRY IN CANADA?

There are a number of good sources of information on the mining industry in Canada including the Prospectors and Developers Association of Canada (PDAC), Mining Association of Canada (MAC), the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), and Natural Resources Canada (NRCan). The Exploration and Mining Guide for Aboriginal Communities explains the mining cycle, the potential impacts of mining and potential opportunities for Aboriginal Peoples and communities. It identifies several additional resources that provide information on how to get involved in mining. There are also a number of internet resources including governmental and non-governmental sources. See for example: www.mining.ca and www.mihr.ca

that are Aboriginal in focus and some that have been created as a result of collaboration with Aboriginal communities. Several initiatives from across the country, that strategically link training to employment through effective Aboriginal human resource strategies and practices, are highlighted. The guide provides insight into the education and training needs of the mining industry, as well as information on jobs and career opportunities. It includes job profiles of individuals employed in various mineral activities and in positions with a variety of skill requirements.

Many people's image of mining involves practices of half a century ago and methods long abandoned by mining companies. But the realities of modern mining paint a very different picture. Today, a career in mining is a safe and lucrative choice. Canadian miners are trained to be skilled men and women some of whom specialize in computers, robotics, satellite imaging and other technologies. Opportunities span the entire mining sequence: exploration, development, operations and closure/reclamation. Mining offers its workers challenge, adventure, good pay and a great opportunity!



Q A HOW DO I FIND OUT ABOUT ESSENTIAL SKILLS TRAINING PROGRAMS?

Essential skills are increasingly recognized by employment counselors and practitioners as the foundation for living, work ing and lifelong learning. There are nine primary essential skills including reading text, document use, numeracy, computer use and oral communication.

Mining Essentials: A Work Readiness Training Program for Aboriginal Peoples teaches 'work readiness' and essential skills defined as critical by industry for employment. Co-owned by MiHR and the Assembly of First Nations, Mining Essentials is teaches industry approved content through Aboriginal cultural methods by local training partners. To learn more about Mining Essentials, visit: www.aboriginalmining.ca.

A number of tools are being used by Aboriginal communities to assess essential skills, including Testing of Workplace Essential Skills (TOWES) and Essential Skills Portfolio (ESPORT). Human Resources and Social Development Canada's Office of Literacy and Essential Skills provides resources for use by individuals and practitioners including a literacy and Essential Skills Toolkit.

Q A WHAT IS THE DIFFERENCE BETWEEN A JOB AND A CAREER IN THE MINING INDUSTRY?

The main difference between a job and a career is the level of satisfaction, personal growth potential, and opportunities for advancement that a career provides beyond the tasks and duties implied in a job description. A job in mining will provide the satisfaction of financial benefits; however, a career in the mining industry means one can find increased satisfaction and potential for personal growth throughout one's employment. In order to develop a career, professional connections are crucial. Networking and professional contacts will be less important if you are only seeking a job on a temporary basis. Another distinguishing factor between a job and a career in mining is the amount of mobility that may be required. To develop a career in mining, individuals may need to relocate, which may mean leaving the community where they grew up, for extended periods of time. Both a job and career in the sector will provide you with essential and transferable skills.

Mining companies have said that the main barriers inhibiting Aboriginal Peoples from participating in the industry are related to lack of experience, inadequate education and training, and the associated training costs for new Aboriginal employees who are often not in possession of the required basic skills. On the other hand, there are relatively few jobs so specialized that they require skills that are not transferable to other industries.

There is a range of Aboriginal-focused training programs that have been developed through successful partnerships between the mining industry, Aboriginal communities, colleges, and governments.

An example of one such collaboration is the Yukon-based 'Get into It' partnership (announced July 8, 2008), which aims

to provide 500 Aboriginal people with skills training leading to an estimated 296 long-term jobs in the mining and resources based sectors.

See the Government of Canada's Aboriginal Labour Market Programs here: *www.hrsdc.gc.ca/eng/jobs/aboriginal*.

Q **WHERE CAN TEACHERS FIND SUPPORT FOR CLASSROOM EDUCATION AND TRAINING?**

A *Established in April 1997, Prospectors and Developers Association of Canada Mining Matters (PDACMM) is a registered charitable organization dedicated to mineral resource education. Resources that support curriculum are available for junior, intermediate and secondary teachers. Lesson plans and educational resources are also available containing current information about rocks, minerals, metals and mining that meet earth science and geography curriculum expectations. Tools available include DVDs and CDs, posters, and information about field trips and rock and mineral clubs for students. PDAC has, through an Aboriginal Outreach program to First Nations communities, visited and provided workshops in several communities in northern Ontario. Tools and resources are available at: www.pdac.ca/miningmatters. Some provincial/territorial mining associations have also developed programs or tools. For further information contact your provincial/territorial mining association.*

Q **HOW MIGHT EDUCATORS FIND INFORMATION ABOUT COOPERATIVE PROGRAMS AND 'HANDS ON' LEARNING OPPORTUNITIES FOR HIGH SCHOOL STUDENTS?**

A *Learning through practical on-the job-training can help all students who are bound for the workplace by helping them make career decisions and develop the knowledge, practical skills and attitudes that will open doors to mining careers. Cooperative work experience opportunities allow secondary school students to train as apprentices and earn academic credits while attending school. Local school boards and provincial education departments will provide more information specific to opportunities in their regions.*

Further information can be accessed through the apprenticeship offices located within each province and territory.

Q **WHERE DO I GO TO FIND OUT ABOUT CURRENT JOB OPPORTUNITIES?**

A *There are three websites dedicated to jobs in mining. These include: Career Mine (www.infomine.com/careers), PDAC Jobs (www.pdacjobs.com), and Northern Miner Jobs (www.northernminer.com/Careers/careers.asp). Most mining company websites also have their own job boards where they regularly post job opportunities and job descriptions that are available to the public.*

As a start to learning about mining, the following websites provide a wealth of information on the Canadian industry.

- Mining Industry Human Resources Council (MiHR): *www.mihr.ca*
- The Mining Association of Canada (MAC): *www.mining.ca*
- The Prospectors and Developers Association of Canada (PDAC): *www.pdac.ca*
- Natural Resources Canada: *www.nrcan.gc.ca/mining-materials*

There are a number of mining associations specific to provinces and territories. See the *Contacts and Resources* section on page 55 for more information.

A. GUIDANCE FOR COMMUNITIES AND HUMAN RESOURCES ORGANIZATIONS

The Mining Industry's Engagement with Communities

The mining industry has embraced the need to continue to build relationships with the Aboriginal community. It is committed to helping Aboriginal workers develop long-term and transferable skills. Over the years it has developed a knowledge base that has built upon the successes and failures of developing relationships between mining companies and Aboriginal communities. The mining industry sees this long-standing relationship as a critical advantage over other industries which do not have the same depth of experience in creating an inclusive workforce. Experience in working with Aboriginal communities has led to a number of best practice approaches for expanding these relationships.

Partnership Engagement Strategies

Mining companies and local communities often develop mutually beneficial partnership engagement strategies. These can range from relatively simple Memoranda of Understanding (MOUs), generally early in the mining cycle, to more comprehensive Impact and Benefits Agreements (IBAs), once a company has committed to develop a mine. To learn more about these agreements, read Lessons Learned: A Report on HR Components of Aboriginal Community and Mining Company Partnership Agreements found under resources on *www.aboriginalmining.ca*.

Preparing Communities for Employment

Community organizations that support training and employment opportunities in Aboriginal communities play an important role in the development and implementation of community-driven engagement strategies. In partnership with the mining industry, best practices in labour force development and employment strategies are formed on the basis of current and projected mining activities, employment demands and associated timeframes.

It is expected that the process for engaging with companies and developing labour market plans will be based on the distinct needs and circumstances of each project. For communities with negotiated agreements, joint strategies and planning is likely already underway.

Research and Information Gathering

Prior to the development and implementation of human resource strategies, the human resource professional should:

- develop community approaches to raise awareness about opportunities in mining and associated skills and education requirements;
- understand human resource commitments, if any, made between the community and the company;
- identify key companies (and unions) involved and what role they will play;
- obtain information from employers about their short, medium and long-term skills and employment requirements; and,
- learn about relevant education and training programs in their region.

Building a Human Resource Strategy

On completion of the research and information gathering, the community organization can now begin to develop its own human resource strategy by:

- working with mining company Human Resources managers to shape their Aboriginal recruitment and retention

Q **HOW DOES THE SIGNING OF AN MOU OR IBA AFFECT EMPLOYMENT OPPORTUNITIES?**

A *Partnership agreements between Aboriginal communities and mining companies range from the establishment of relatively informal arrangements (e.g. handshake or Memorandum of Understanding) at an early stage of exploration to more formal Impact and Benefit Agreements (IBAs) which are typically entered into between Aboriginal groups and a project proponent seeking development approval. Each agreement is distinct. However, these agreements generally address a number of issues such as surface access, employment, training and education commitments and provisions for contracting and business opportunities as well as for IBAs' compensation. Most agreements have provisions for ongoing monitoring and evaluation of employment participation and economic progress. A map indicating where IBAs have been signed between Aboriginal communities and mining companies in Canada is available through NRCan. Contact NRCan to request these maps.*

Q **WHERE CAN ABORIGINAL ORGANIZATIONS APPLY FOR ADDITIONAL FUNDING FOR THEIR SKILLS DEVELOPMENT AND EMPLOYMENT PROGRAMS?**

A *There are a number of federal programs aimed at increasing workplace skills development and employment. Some Aboriginal community organizations have accessed resources through Human Resources and Social Development Canada's Workplace Skills Initiative for projects addressing skills shortages in partnership with employers. The Office of Literacy and Essential Skills (HRSDC) provides funding opportunities for skills development and employment projects. In addition, many provinces have Labour Market Development Agreements or Labour Market Agreements with the federal government. These intergovernmental agreements typically 'earmark' resources for employment supports, and trades and apprenticeship training, particularly for underrepresented groups including Aboriginal Peoples.*

strategies (set goals, objectives and key principles);
- approaching the union (if any) that represents the company's workforce to discuss the impacts a collective agreement could have on the hiring of local employees;
- creating an inventory of aptitudes and skills of community members, e.g. Prior Learning Assessment Recognition (PLAR) or Test of Workplace Essential Skills (TOWES);
- leveraging public and private sector resources to create on-the-job training programs tailored to the specific needs of the company and community; and
- developing plans to help workers make the transition into other opportunities once the project ends.

Implementation and Monitoring

On completion of the human resource strategy the community organization can now:
- seek the support of community members for the strategy;
- implement the strategy in collaboration with the mining company with the intent of generating local interest in employment opportunities in mining; and
- jointly assess the successes and challenges of implementing the strategies/plans and make necessary adjustments.

B. GUIDANCE FOR EMPLOYMENT SEEKERS

Making the Right Career Choice is Important

When choosing a career it is important that a person chooses work that he or she finds interesting. The mining sector offers a great variety of interesting career opportunities where one can acquire both transportable skills (to work in other phases of the mine cycle or at other mines) and transferable skills (to work in other sectors). Mining also provides on-the-job training which can lead to opportunities for career advancement. Some people may wish to use their experience in the industry to launch their own business for mine services.

What Aptitudes are Required for a Career in Mining?

Generally speaking the mining industry is looking for people who are;
- safety conscious and respectful of others:
- in good physical and mental condition;
- enjoy a flexible work schedule and are willing to relocate or work in fly-in remote locations;
- willing to work as a team member;
- committed and take pride in their work; and
- eager to learn on-the-job and transmit their knowledge to others.

Determine if Mining is Right for You

Before embarking on a mining career it is important that you ask the question, "Is mining a proper choice for me?" Fortunately, there are a number of self-assessment tools that can help determine your interests and aptitude for mining-related occupations:
- Explore for More: *www.acareerinmining.ca*
- Employment and Social Development Canada: *www.esdc.gc.ca/eng/home.shtml*
- The Guiding Circles Workbook, created by the Aboriginal Human Resources Council: *www.aboriginalhr.ca/en/products/publications*
- Essential Skills Portfolio (ESPORT): *www.esportfolio.com*
- The "Know Yourself" Quiz: *www.canlearn.ca*
- "Identify Your Career Options": *www.jobsetc.gc.ca*
- "Working in Canada": *www.workingincanada.gc.ca*

Another great resource you can tap into is your community career practitioner.

Build a Plan for Your Career in Mining

Now that you know you have an aptitude for mining, the following checklist is designed to help find employment in this industry.

Before submitting an application, it is important that you research the mining industry and its potential career opportunities. This can be accomplished by:
- using the guide and/or portal (*www.aboriginalmining.ca*) to gain a greater awareness of the mining process and the typical occupations and employment opportunities in mining;
- gathering information about mining activities in your area;
- identifying the mining companies operating in your area and their human resource managers' contact information (e.g. provincial and territorial mining association websites and *www.nrcan.gc.ca/mining-materials*);

and

- browsing jobs posted in various mining job banks to get an idea of the opportunities available and to learn about minimum employment requirements, e.g.:
  www.pdacjobs.com
  www.workingincanada.gc.ca
  www.infomine.ca

Once you have completed your initial research, ensure that you:

- contact your local Aboriginal training and employment or education organization to explore opportunities for education, training and employment support;
- are prepared to undertake the required education and/or training;
- develop your resume, considering your career goals, and covering letter. Assistance in resume and covering letter writing can be found at:
  www.youth.gc.ca/eng/topics/jobs
- send your application to the company's human resources manager; and
- follow up!

Q **HOW SHOULD WE ENGAGE WITH UNIONS AND WHAT IMPACT DOES A COLLECTIVE AGREEMENT HAVE ON JOB OPPORTUNITIES?**

A *Unions should be contacted early in the training and employment planning process if the worksite of the mine is unionized. Ask the company you are in touch with or inquire at the provincial mining association about which union represents the workers at the project that is being developed near your community. A collective agreement is a legally binding contract between an employer and the union representing the employees, which contains provisions respecting conditions of employment. It is a good idea that employment counselors in your community get in touch with a union representative in order to understand the impact that the collective agreement will have on the process for entering the mine workforce and the conditions of employment once an individual is employed.*

Q **WHO ARE THE MAIN EMPLOYERS OF PEOPLE WHO WANT A JOB PROVIDING SUPPORT SERVICES TO MINING COMPANIES?**

A *Many Aboriginal-owned businesses exist to provide support services to the mining industry. These are excellent employers for Aboriginal youth wishing to enter an occupation in the support services category as a starting point for a career in mining. An example of such a business is the Athabasca Basin Development Limited Partnership. There are many support services companies that could provide employment opportunities to trained individuals from Aboriginal communities. For further information on companies that provide support services to the mining industry, contact the provincial mining association nearest you.*

Q **WHAT ARE THE CERTIFICATION REQUIREMENTS FOR WORKING IN MINING?**

A *Certification depends on the type of employment. There are over 120 occupations in the mining industry. In the professional and technical occupations, employees must meet the requirements of the provincial/ territorial jurisdictions in which they work. Similarly, skilled trades require completion of a provincial journeyman apprenticeship program. In contrast, most production-related mining jobs are not certified and do not require prior credentials or training programs. Training is generally provided on the job. For more information and potential career path information go to: www.acareerinmining.ca*

EXPLORATION

A. ACTIVITIES IN EXPLORATION

Exploration is the first phase of the mining cycle and normally takes place in remote parts of the country, including areas near Aboriginal communities. In the exploration phase, the goal is to locate new sources of ore (a metal bearing mineral or rock). If the results of exploration are not promising and an economic deposit is not found, the site will not be developed into a mine. Roughly one in 10,000 mineral showings results in a mine. The exploration phase generally occurs during summer months and can last between seven and ten years (or more) before the site is developed into a mine. During this period, the company spends money raised through investors, but generates no income as there is no mineral production.

Exploration activities include:

- prospecting
- claims staking
- detailed exploration
- sampling and drilling
- environment baseline work
- preliminary deposit evaluation

B. CAREERS IN EXPLORATION

The following pages provide a brief description of a few of the many occupations normally found in this phase, including the typical activities, employment requirements, work schedules, and typical salary ranges.

It is important to note that salary ranges vary from region to region and will change over time. Check sources, such as *www.acareerinmining.ca*, *www.workingincanada.gc.ca*, job postings on employers' websites, and job banks (e.g. *www.pdacjobs.com*) for more information about salaries.

To create a balanced view of jobs across all skill levels, a variety of entry level, skilled, trades, technical and professional jobs are included. This job inventory is intended to highlight some key occupations of the estimated 120 occupations in mining. Some jobs are available in more than one of the mining phases. Contractors and suppliers also provide employment opportunities in various support services throughout the mining cycle. Some support services of particular importance to exploration include cooking, labour, drilling, line cutting, transportation, health and safety, and security.

For a comprehensive listing of occupations at each phase of the mining cycle, see pages 47 to 54 of this guide.

Prospector

Description: Prospecting is an activity that may take many forms, from walking on the land with a rock hammer, map and compass, to using sophisticated tools to identify exact positions using satellites (global positioning system [GPS]). A prospector walks the ground, examining and mapping rock types and collecting rock and soil samples by hand for either mineral or chemical analysis. If a prospector believes that further work is justified, a mining claim will be staked. In order to stake a claim, however, it is necessary to have a prospector's license.
Employment Requirements: One can become a prospector with a grade 12 education (or less).
Work Schedule: Many prospectors are self-employed and can set their own hours. Most often, a prospector's day is long and he or she is navigating through difficult terrain in remote locations.
Salary Range: Many prospectors are self-employed or contractual. Their salaries depend on the contracts they hold with different companies.

Line Cutter

Description: A line cutter helps to create a grid by placing markings at regular intervals on a potential mine site to allow for geological and other surveys. This may require the blazing of trees and cutting of underbrush. Often the company leading the exploration (or mine) operation hires service providers for this task.
Employment Requirements: A line cutter usually requires grade 12 or less, should be in good physical condition and able to operate a chain-saw.
Work Schedule: Line cutters generally work long hours in sometimes difficult terrain.
Salary Range: Many line cutters earn minimum wage or more, depending on their work conditions, their work schedule, and their length of employment.

Driller

Description: A driller drills holes to get core samples that geologists assess to determine the mineral potential, subsurface geometry, and volume of an ore body. Often the company leading the exploration (or mine) operation hires service providers for this task.
Employment Requirements: Many companies require that an individual have previous mining experience to become a driller. Some companies may even require certification or on-site training. Individuals also need to be in good physical condition as the job entails working with heavy materials (drill rods, pipes, core, etc.).

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WHAT IS A 'FLY IN/FLY OUT' WORK SCHEDULE?

Companies, particularly in remote areas, bring people to and from the mine or exploration site on a rotating schedule. For example, some people may work three weeks at the site and then have two weeks off. The schedule differs from company to company. The company provides transportation, accommodations, food, health care, and some companies provide recreation, counseling, and other services on-site.

Work Schedule: A driller's work schedule will vary widely (days, afternoons, nights) depending on the location of the exploration projects which are often in remote areas.
Hourly Rate: $25 – $40.

Geologist

Description: Geologists operate in all phases of the mining cycle; however, at this stage, they are responsible for daily control over exploration activities. They conduct exploration and research programs to locate mineral resources and make sure that good sampling is carried out. They collect and interpret rock samples and cores, classify rocks and minerals, collect and analyze soil and sediment samples in geochemical surveys, and prepare geological maps. Other functions include hiring contractors, managing the exploration budget and logistics for the crew, writing reports, and making presentations to head office with recommendations for further work.
Employment Requirements: A bachelor's degree in Geology.
Work Schedule: An exploration geologist can have an office or laboratory job working a typical workweek (Monday to Friday 9am–5pm), or he or she can work in the field with longer hours, sometimes on evenings and weekends during any season, and often in remote areas.
Salary Range: $62,000 – $104,000 a year

Environmental Coordinator

Description: Environmental coordinators assess and manage the effects of human and other activity on the natural and built environment. In the exploration phase, the environmental coordinator is responsible for coordinating environmental-related research projects and the environmental impact of mine development. An environmental coordinator advises on the safe disposal of wastes and prepares plans for dealing with risks. Environmental baseline studies are required as part of the feasibility assessment. The work of the environmental coordinator informs these studies, while identifying and meeting regulatory timelines. Environmental coordinators must be effective communicators both verbally, as they explain relevant issues to other technical staff, managers, regulatory authorities, interest groups and the public, and in writing, as they perform audits, and are responsible for record keeping, and report writing.
Employment Requirements: A university degree in Natural Sciences, Environmental or Civil Engineering.
Work Schedule: Environmental coordinators, for the most part, work typical office hours (Monday to Friday, 9am–5pm). Some may also work fly-in/fly out schedules. Pressing deadlines may require hours in excess of a 40-hour workweek.
Salary Range: $62,000 – $150,000 a year

Geographic Information Systems (GIS) Technician

Description: GIS are computerized data banks of spatial data. A GIS technician focuses on the collection and analysis of geographic spatial information by combining mapmaking and surveying functions. A GIS technician gathers information on landscapes to create maps, gathers data from a variety of different sources (maps, aerial and satellite photographs, sketches from field notes, etc.), processes the data into a digital format and prepares a final version of a map.
Employment Requirements: GIS technicians require a college diploma in Mapping and/or GIS.
Work Schedule: GIS technicians work a typical workweek (Monday to Friday, 9am–5pm) in an office environment
Salary Range: $59,000 – $85,000 a year

Geophysical/Geological Technician

Description: Geophysical/geological technicians examine records and analyze geologic data. They perform initial tests for mineral presence and are thus vital to the exploration phase. The search for mineral deposits often requires the specialized skills of geophysical technicians to assist in identifying large areas that may contain ore deposits for potential development as well as analyzing the geophysical aspects of deposits.
Employment Requirements: A college diploma is generally required. For senior geophysical technician positions, employers often require a bachelor's or master's degree in Geology, Geoscience, Earth Science, Geophysics, or a related field.
Work Schedule: A geophysical/geological technician's work schedule will vary widely (days, afternoons, nights) depending on the location of the exploration projects which are often in remote areas.
Salary Range: $50,000 – $68,000 a year

Geochemist

Description: Geochemists collect and analyze geochemical survey data, and drill core samples and rock samples to identify chemical and mineral composition.

Employment Requirements: Geochemists require a minimum of a bachelor's degree that can be in a number of different fields (geology, chemistry, math, physics, etc.).

Work Schedule: Some geochemists work in a lab environment, and in these situations, they work a relatively regular schedule (Monday to Friday, 9am–5pm). Geochemists who work in the field, gathering data and analyzing samples, may work long hours and during weekends, especially if travel is required to work in a remote location.

Salary Range: $65,000 – $140,000 a year

C. EDUCATION AND TRAINING PROGRAM SHOWCASES

Aboriginal Minerals Training and Employment Program (AMTEP)

Overview: AMTEP is a partnership between the Mining Technology Program at the British Columbia Institute of Technology (BCIT), the Association for Mineral Exploration BC, the Mining Association of BC, and the British Columbia Ministry of Exploration Mines and Petroleum Resources. Its aim is to increase participation of Aboriginal people through a multi-year integrated training and employment program. Training begins with a two-day community awareness workshop to provide information on the mining industry and an overview of opportunities for Aboriginal people and communities. The next step is a two-week training course in basic geology, prospecting and mineral exploration. Students can then move on to a three-month BCIT Associate Certificate in mineral exploration and mining or pursue trades training in a number of fields. Training often leads to apprenticeship and certification as a journeyperson or to a career in mining and mineral exploration technology, geology or mining engineering. Co-op Associate Certificate in Minerals Technology is a three-month training program that consists of technical courses related to mineral exploration and mining with supporting courses in areas such as communications. The certificate program will involve a total of 15 to 20 weeks of training divided into five-week modules. It is planned that each module will alternate with periods of employment such that the entire co-op certificate program can be completed in one to three years. Entrance requirements are completion of grade 10 or higher including math and science.

Features:

- Guidance and support for students in trades training, and assistance to students in arranging apprenticeship training with a minerals exploration employer
- Trades training may be integrated with essential skills courses based on individual and community needs
- Academic and essential skills upgrading is provided
- A good practice of collaboration/partnership with Aboriginal communities and organizations

For further information: *www.bcit.ca*

Nunavut Prospectors Program (NPP) and Introductory Prospecting Course

Overview: The Government of Nunavut released Parnautit: the Nunavut Mineral Exploration and Mining Strategy in 2007. The Strategy states that, in order for Nunavummiut to take advantage of the employment and business opportunities related to exploration and other mining activities, government and industry will need to work with Inuit organizations and communities to develop and coordinate effective education and training programs. It estimates that as many as 4000 new mine-related jobs could be created in Nunavut over the next ten years. Government-supported prospector development and field assistant programs can provide Nunavummiut with the basic skills for employment with exploration companies. Through the NPP, technical and financial assistance is provided to Nunavummiut with demonstrated prospecting skills to carry out their own prospecting projects. Also, Government of Nunavut geologists present a six-day Introductory Prospecting Course to interested residents of the 25 communities across Nunavut. Graduates of the course often apply for NPP grants and many are employed as field assistants on mineral exploration projects.

Features:

- An opportunity for community-based learning and employment opportunities
- A link between programs to increase success
- Basic knowledge and skills for individuals to begin careers as prospectors

- Incentive for local Inuit to participate in the benefits of the exploration phase
- Partnerships based on respect for Inuit Qaujimajatuqangit concepts
- Enhancing the foundation of the mining industry through prospecting and geo-science

For further information: *www.edt.gov.nu.ca*

Northwest Community College, School of Exploration and Mining

Overview: Offering a range of industry-driven programs, the school is a result of a partnership between Smithers Exploration Group and the BC Ministry of Energy, Mines and Petroleum. Community-based opportunities are guided under the direction of Northwest Community College's First Nations Council. Programs include the following:

– *Camp Management Program:* The program combines the practical and technical skills training necessary to build and maintain temporary camps that are used in remote work sites in industries such as exploration, forestry, and guide outfitting. Training consists of classroom learning and hands-on field experience where students work together to safely and efficiently build and maintain a fully operational camp. (Available on contract)

Features:

- Curriculum developed and taught by First Nation industry professionals
- Program also includes job placement support

PROFILE: James A. MacLeod — LOCATION: Québec

Position: James MacLeod, a Cree and resident of Mistissini, Quebec, is well known and respected in the mineral industry throughout Canada as a mining exploration technologist. Mr. MacLeod specializes in the area of mineral exploration, including prospecting, claim staking, line cutting, geophysical instrumentation and camp construction and management.

As President of Cree Gold Inc. and J.A. MacLeod Explorations, Mr. MacLeod is very familiar with the management and development of exploration companies. He has served on the Board of Directors of the Mistissini Geological Resources Centre, Cree Gold Inc., Canadian Aboriginal Minerals Association and various other junior mining companies. Mr. MacLeod was a founder of the Mistissini Geological Resources Centre and has worked closely with native communities as a consultant on projects and training in mining exploration.

Mr. MacLeod began his career in mineral exploration as a young man. He later trained as an RCMP Native Police Officer and with the Quebec Provincial Police and served as Chief of Police with the Mistissini Police Force from 1972 to 1987, after which he founded J.A. MacLeod Explorations and focused his energies, knowledge and expertise on mineral exploration. He is a member of the Quebec Prospectors Association, Prospectors and Developers Association of Canada, Canadian Institute of Mining, and the Canadian Aboriginal Minerals Association. His wealth of mining knowledge, experience, expertise and industry contacts, make him invaluable as a consultant in exploration and project development.

Mr. MacLeod is a strong advocate of education and advises youth to participate in all forms of training available to them. J.A. MacLeod Explorations currently hires and facilitates the hiring of Cree youth in mining exploration.

- The final two weeks of the program is spent entirely on location in a remote bush camp
- Offered in partnership with the Smithers Exploration Group and the Province of BC

– *Drill Core Technician Basic Training:* This course provides graduates with the practical skills required to observe, measure and record information from diamond drill core. Upon graduation, students will know how to process and safely handle core boxes, how to operate and maintain a core-splitter, and the correct procedures for handling samples.

Features:

- Measuring core and recording technical data
- Handling, labeling, organizing, and storing core boxes
- Splitting and sampling core
- Quality assurance /quality control of data
- Familiarization with diamond drilling
- Safe work procedures and employer expectations

– *Mining Exploration Field Assistant Program:* This one-week program is taught outdoors in a remote camp and prepares workers to meet the physical demands of entry-level employment in exploration. Graduates may become employed with mining consultants, junior exploration companies, drilling and geoscience companies and government.

– *Surface Drillers Helper Program:* A three-week program designed to provide hands-on, competency-based instruction in a field setting. Graduates have the ability to operate the equipment used in various diamond drilling operations.

Features:

- Students are taught by First Nations and other industry instructors, as well as First Nations Team Leaders and Elders.
- Job Placement and Employment Advisors are available to assist with facilitating employment of graduates
- Learning is often based in a realistic 'field setting' or work environment
- The College offers a First Nations Land Stewardship Program and other technical programs
- A Trades Access program prepares students for trades and apprenticeship programs or for entry-level employment
- Career College Prep is offered, as well as Testing of Workplace Essential Skills (TOWES)

Northwest Community College's Workforce Training & Continuing Studies (WTCS) and Trades department also offers the following exploration & mining industry-related training:

- Mobile, Contract, and Campus-based Health and Safety Training (Occupational First Aid, WHMIS, TDG, Bear Awareness, Spill Response, Chainsaw Safety, Helicopter Safety, etc.)
- Heavy Equipment Operator Technician Apprenticeship
- Other Trades Foundation and Apprenticeship Programs
- University Credit - Associate Degrees

For further information: *www.nwcc.bc.ca*

DEVELOPMENT

Mine development is the second phase of the mining cycle. The purpose of this important phase is to learn about the potential value of a mineral deposit, determine if it can be mined profitably to the benefit of the mining company and the region, and if so, to build a mine. This phase can take anywhere from five to ten years.

A. ACTIVITIES IN DEVELOPMENT

The main activities of mine development include:

- collecting more technical, environmental and socio-economic data to increase the company's knowledge of the resources. This means more samples, more drill holes, and more field tests;
- developing the mine plan and infrastructure;
- consultations between government and mining companies to make sure that regulations are met. Mining companies also consult with communities to make sure that their needs and requirements are addressed;
- evaluating financial, socio-economic and environmental impacts; and
- obtaining permits and licenses.

The final evaluation of the project is carried out and the production decision is taken. The mine and its facilities are built, ready to start operations.

B. CAREERS IN DEVELOPMENT

The following pages provide a brief description of a few of the many occupations normally found in this phase including the typical activities, employment requirements, work schedules, and typical salary ranges. It is important to note that salary ranges vary from region to region and will change over time. Users of the guide can check sources, such as *www.workingincanada.gc.ca*, *www.acareerinmining.ca*, job postings on employers' websites, and job banks (e.g. *www.pdacjobs.com*) for more information about salaries.

PROFILE: Joyce Dumais — LOCATION: Alberta

Position: Welder at Syncrude Canada Ltd. in Mildred Lake in Fort McMurray, Alberta. Joyce Dumais of the Fort McMurray #468 First Nation began in the mining industry as a welder's helper 10 years ago. At the time, Joyce was aware that journeymen welders were in high demand, so she decided to pursue this career path. She has since become trained as a Journeyman Welder. In fact, Joyce was the first female to graduate from the Alberta Aboriginal Apprenticeship Program and she won't stop there!

Joyce is certainly a woman who is determined to succeed. Her immediate career plan involves getting into quality control in the mining industry, but ultimately, her aspiration is to work with Aboriginal individuals. She wants to help First Nations people get their high school diplomas and get into apprenticeship programs and universities. Joyce has firsthand experience in the mining industry and knows there are many jobs available to Aboriginal individuals who are interested in mining, and she wants to help.

Her journey has not been an easy one. Joyce has had to use significant time-management skills in order to raise two children while working 12-hour shifts at a job that was an hour away from home. When her children were young, it was not uncommon for Joyce to have to leave them with the babysitter at 4 am so she could make it to work for her shift. Now that her children are teenagers, it is a little easier to schedule their lives together, with her career.

Joyce has experienced her share of prejudice as a Native female apprentice working in a male-dominated industry. But according to Joyce, the environment in the mining industry has changed for the better. It has become a healthier environment in which to work. In response to the adversity she experienced at the beginning of her career, Joyce has learned how to stand up for herself, and how to work towards her dreams without being discouraged by others. Joyce has great determination and many dreams beyond her already considerable accomplishments.

Joyce's work-schedule (12-hour shifts of four days on, five days off, five days on, four days off) guarantees that she has at least two weekends off a month, enabling her to spend time with her children when they are not in school. Joyce would love to become more involved in Native culture and would love it if more powwows were hosted in her area. Where she grew up, in Bonnyville, south of Fort McMurray, if a powwow were hosted, thousands of people would attend. She hopes that, one day, Fort McMurray will also be home to more cultural activities.

"It doesn't matter how small or insignificant you might feel where you are right now. Always keep your dreams big. Think big. If you stay positive and keep an open mind and stand up for yourself, eventually you'll get what you want: you'll achieve your goals. I'm not done here, just being a welder. I've got my goals set as well." *Joyce Dumais*

To create a balanced view of jobs across all skill levels, entry level, skilled, trades, technical and professional jobs are included. This job inventory is intended to highlight some key occupations of the estimated 120 occupations in mining. Some jobs are available in more than one of the mining phases. Contractors and suppliers also provide employment opportunities in various support services throughout the mining cycle. Some support services of particular importance to development include carpenters, plumbers, electricians, pipefitters, welders and mechanics. For a comprehensive listing of occupations at each phase of the mining cycle, see pages 47 to 54 of this guide.

Surveyor

Description: Surveyors are technicians responsible for preparing the surface plans for a mine. Surveyors take measurements through advanced surveying techniques and instruments that help inform development. A surveyor maps, explores and helps develop sites for mineral extraction.
Employment Requirements: Surveyors generally require a post-secondary certificate or diploma in Geomatics (Surveying) Engineering Technology; however, it is possible to be hired as an assistant surveyor without formal training.
Work Schedule: Surveyors sometimes work long hours in difficult terrain and employment can be either year-round or seasonal.
Salary Range: $51,000 – $80,000 a year

Mining Engineer

Description: The mining engineer's primary role is to decide on the best way to get ore out of the ground. In this phase, they work with a team to create a plan to develop the mine efficiently and effectively. Using computer-aided design packages, they prepare detailed plans for mines (including the tunnels, shafts, etc.) and plan the development process. They then oversee the construction and consult with geologists and other engineers about necessary machines, facilities, and infrastructure for the site.
Employment Requirements: A bachelor's degree in Mechanical and Industrial Engineering and Technology and related programs.
Work Schedule: Most engineers work 40-hour workweeks (Monday to Friday, 9am–5pm); however, depending on the development schedule, a mining engineer might work longer hours to meet developmental execution plans.
Salary Range: $70,000 – $107,000 a year

Mechanical Engineer

Description: Mechanical engineers work with many kinds of machines that produce, transmit, or use power, and often also design tools that other engineers need. They conduct research into the feasibility, design, operation, and performance of mechanisms, components and systems which will be used in a mine. A mechanical engineer often approves designs, calculations, and cost estimates.
Employment Requirements: A bachelor's degree in Engineering is required. Some companies may require a candidate to have a master's degree in Engineering.
Work Schedule: Engineers typically work 40-hour workweeks (Monday to Friday, 9am–5pm); however, pressing deadlines sometimes increase work hours.
Salary Range: $69,000 – $115,000 a year

Mining Technician

Description: Mining technicians work in every stage of the mining cycle. During development, mining technicians work on-site and in the engineering offices of mining operations. Mining technicians provide technical assistance to professional engineers. Technicians gather information by performing chemical and physical tests. They may also assist in surveying and drafting, and in planning solutions to engineering problems.
Employment Requirements: A technical college diploma (usually a one or two-year program).
Work Schedule: Technicians generally work 40-hour workweeks (Monday to Friday, 9am– 5pm). They are often required to do shift work and divide their time between offices, laboratories and mines.
Salary Range: $59,000 – $87,000 a year

Machinist

Description: Machinists set up and operate a variety of tools to cut or grind metal, plastic or other materials to make or modify parts or products with precise dimensions. A machinist makes and fixes equipment parts.

Employment Requirements: A high school diploma is generally required. Trade certification through a four-year apprenticeship program can be taken, but is not required in all jurisdictions.
Work Schedule: A machinist working in a mine is likely to work shifts (days, afternoons, nights), or to be on call to respond to situations arising with machinery that could affect construction or production.
Hourly Rate: $30 – $41

Millwright

Description: Millwrights move and install heavy machinery. They may have to inspect, repair, and clean industrial machinery and equipment. They may be required to operate cranes and tractors to move machinery. They must also be skilled in many construction activities: bricklaying, painting, plumbing, welding, and electrical work may all be part of a millwright's job. Millwrights use these and other skills to build concrete foundations for heavy equipment, assemble new machines, and replace worn parts.
Employment Requirements: To be a millwright, one does not have to be certified; however, it is recommended. To become certified, an individual is usually required to go through a four-year apprenticeship program. For initial hire, a grade 12 diploma is required.
Work Schedule: Typically, millwrights work 40-hour workweeks (Monday to Friday, 9am–5pm); however, if a millwright is on duty for maintenance support, they may be required to do shift work (days, afternoons, nights).
Hourly Rate: $23 – $52

Geological Engineer

Description: Geological engineers conduct geological and geotechnical studies to assess suitability of locations for mining projects. They plan, design, develop and supervise programs of geological data acquisition and analysis and prepare geological engineering reports and recommendations. Generally, geological engineers help find deposits of coal, minerals, and metals. They also help design mines and mining equipment and they help determine how to extract the useful material from the earth.
Employment Requirements: A bachelor's degree in Engineering is required.
Work Schedule: Most engineers work a typical 40-hour workweek (Monday to Friday, 9am–5pm), but this can be extended when deadlines are pressing.
Salary Range: $80,000 – $140,000 a year

C. EDUCATION AND TRAINING PROGRAM SHOWCASES

Mining and Mineral Exploration Technology, British Columbia Institute of Technology (BCIT)

Overview: The British Columbia Institute of Technology (BCIT) offers a full-time Diploma of Technology. This program is designed to prepare workers for technical jobs in geology, engineering, exploration, mineral processing, surveying, environmental areas, and management with mining and exploration companies. This program prepares graduates for a diverse range of employment opportunities including jobs in remote exploration camps, mine sites, engineering consulting companies and assay labs.

Features: The two-year Mining and Mineral Exploration program offers first year training in basic science, math and communications, as well as geology, mining methods, blasting, surveying and computer applications. In the second year, the emphasis is on mining and the engineering and science skills required for the mining sector. The program is supported by industry in BC and offers practical learning opportunities through field trips to mine sites. An optional work experience certificate course is also available and is made possible as a result of a partnership between the Mining Association of BC and BCIT's Mining Program. Students can expect to receive assistance in finding paid summer employment in the mining and minerals industry between the first and second year of studies. Entrance requirements include high school completion with English, math, and chemistry or physics.

For further information: *www.bcit.ca*

Women in Trades, Saskatchewan Indian Institute of Technologies (SIIT)

Overview: The Saskatchewan Indian Institute of Technologies' (SIIT) Women in Trades program is an Aboriginal-focused initiative designed to increase the participation of women in trades and technological careers. In addition, there is a range of training programs in learning institutions across Canada that are designed for women.

Features: The Women in Trades program includes topics such as industrial construction academics, site safety, and use of hand tools. The program facilitates greater understanding of the work involved in trades such as electrical work, carpentry, and plumbing. Although an education level of grade 12 is preferred, as employers may require high school completion, the program has an entrance requirement of grade 10. The length of the program is generally 12 weeks. Graduates obtain an Applied Certificate and may pursue further training in Industrial Career Development and related programs.

For further information: *www.siit.sk.ca*

Mine Training – Northlands College

Overview: Northlands College, located in Northern Saskatchewan, offers a variety of mining industry training and employment programs. Multi-party training plans are developed through which the training needs of the mining sector are identified and programs are delivered in direct partnership with local employers.

Types of programs offered:

- Exploration (geophysics survey operator, line cutting, and prospecting)
- Technical Training (chemical laboratory technician, geological technician, process operator, and radiation environmental monitor)
- Trades apprenticeships and on-the-job training programs for trades and vocations including mill operator, camp cooking, underground mining, security guard, truck driver, carpentry, electrical, and industrial and heavy-duty mechanic

Features:

- Trades programs delivered in direct partnership with industry
- Academic upgrading opportunities including preparation for the trades, pre-technologies and developmental studies for students who need math and science upgrading in order to be successful in technical or trades programs
- High rates of program completion
- Extended work placements with industry
- Transfer of credits for technical level courses for further training at SIAST (Saskatchewan Institute of Applied Science and Technology), NAIT (Northern Alberta Institute of Technology) and SAIT (Southern Alberta Institute of Technology)

For further information: *www.northlandscollege.sk.ca*

Haileybury School of Mines (HSM) – Northern College

Overview: One of the oldest schools of mine training, Haileybury College offers a range of programs. Haileybury is also a co-founder, along with Cambrian College, of the Federated School of Mines. The school is a collaboration of post-secondary institutions including Collège Boréal, Confederation College, Laurentian University, Sault College and Canadore College, and its goal is to attract people to the north, encourage northerners to stay and strengthen communities through access to education and training.

One of the key programs offered by HSM, as well as other learning institutions across Canada, is the Mining Engineering Technician program. This four-semester program is delivered in a module format allowing students to link training to employment goals. The program offers graduates potential employability in all aspects of mining as surveyors, planners and production supervisors, through to mine managers. Many graduates are also employed as assayers, process controllers, metallurgical technologists and sales and service technicians in indirect mining sectors.

Features:

- Job developers help students link training directly to employment with several mining projects including Porcupine Joint Venture/Goldcorp; Liberty Mines; St. Andrew (Matheson); DeBeers Victor Project (Attawapiskat); XSTRATA Copper; and Lake Shore Gold Corporation
- Offers Pre-apprenticeship Electrical and Construction Craft Worker programs that are Aboriginal-focused
- Combines distance education with lab courses and hands-on experience to enable flexible learning
- Promotes the development of employability skills for the mining industry domestically and internationally
- Curriculum is recognized by the Ontario Association of Certified Engineering Technicians and Technologists
- An integrated curriculum is intended to provide graduates with the ability to shift laterally in a mining company as priorities and economic realities change

For further information: *www.northernc.on.ca*

Thompson Rivers University, School of Trades & Technology

Thompson Rivers University (TRU) works with industry organizations to deliver and offer training programs that prepare learners to work in the mining sector. From “Trades” and apprenticeship training to specific mine programs, TRU trains a labour force for the mining industry.

Essential Skills Upgrading

Through a flexible, welcoming model, students are able to prepare for their next steps in meeting the academic requirements to obtain entry-level mining positions or move forward in achieving their Adult Dogwood Certification. In a face to face classroom setting, students are able to work at their own pace as well as participate in structured lesson plans which support numeracy and literacy upgrading.

Heavy Equipment Operator

TRU has designed a one week heavy equipment operator entry level course which will increase the opportunity for employment for British Columbia Aboriginal Mine Training Association (BCAMTA) candidates at a mine site. In this course, students receive introductory equipment training on excavators, dozers, articulated rock truck and loader. This introductory program gives students the chance to train at a fully functioning mine site while receiving heavy equipment operator training relevant to mining heavy equipment operations.

Mining Training for an Entry Level Workforce

With funding from MiHR, TRU has developed an introduction to mining program complemented with provincially and nationally recognized safety certifications. Students participate in an Introduction to Surface, Underground and Mineral Processing component which introduce the students to the various types of mining: surface, underground and mineral processing. Students learn about the history of mining, the important historic role of Aboriginal participation in mining, the economic importance, exploration and mine reclamation.

Students also have two site visits which will include surface and underground mining operations. Students also receive training and certification in First Aid with a Transportation

Endorsement, Confined Spaces, Logout/Tagout Procedures, Respiratory and Personal Protection Equipment overview, H2S Alive, Fall Protection, Industrial Fire Defence and Extinguisher, Introduction to the Mines Act, Mine Site Communications, Rigging and skid steer Certification.

Pathway to Dogwood

In partnership with BCAMTA, TRU offers First Nations learners the opportunity to achieve their Adult Dogwood High School diploma, allowing students to meet prerequisites for admission into a diverse range of educational programs. Courses are designed for adult learners and delivered in small, student-centered classes through teaching methods that accommodate students' life experience, cultures and different learning styles. This program assists BCAMTA candidates in achieving employment at mines within the province.

Aboriginal Women in Trades Training

In 2010, the Industry Training Authority of BC with LMDA funding began supporting a 15 week program where 15 Aboriginal women were introduced to a variety of trades, along with numeracy and literacy upgrading. The majority of these trades are found in a mine operations setting.

Through this program, students receive certification in Flagging, WHMIS, TDG, Rigging/Hoisting and Forklift training. This provides opportunity to ladder into foundation trades programs and continue training to achieve their Certificate of Qualification with "Red-Seal" endorsement.

Students participate in technical training which encompasses theory and practical learning modules in:

- Construction Electrician
- Instrumentation Mechanic/Industrial Electrician
- Glazier
- Piping Trades
- Heavy Equipment Operator
- Parts-person

For more information on TRU's programs, please visit:
www.tru.ca/trades

OPERATIONS

A. ACTIVITIES IN OPERATIONS

Mine operations is the third phase of the mining cycle, when ore is being extracted and is being processed into product. There are two types of mines: underground and open pit; and four main work areas: excavation areas, processing plant, waste storage, and supporting services. A mine can operate for several years, or can be in the operations phase for several decades. Activities in the operations stage may include:

- hiring;
- training;
- commissioning, or putting a mine into production;
- production, where waste rock is separated from valuable metals or minerals and the product is prepared; and
- mine expansion. Some mines that are not able to keep up to demand with existing infrastructure require expansion.

B. CAREERS IN OPERATIONS

The following pages provide a brief description of several of the many occupations normally found in this phase including the typical activities, employment requirements, work schedules, and typical salary ranges. It is important to note that salary ranges vary from region to region and will change over time.

Users of the guide can check sources, such as *www.workingincanada.gc.ca*, *www.acareerinmining.ca*, job postings on employers' websites, and job banks (e.g. *www.pdacjobs.com*) for more information about salaries.

To create a balanced view of jobs across all skill levels, entry level, skilled, trades, technical and professional jobs are included. This job inventory is intended to highlight

some key occupations of the estimated 120 occupations in mining. Some jobs are available in more than one of the mining phases. Contractors and suppliers also provide employment opportunities in various support services throughout the mining cycle. Some support services of particular importance to operations include security, cooking, maintenance, transportation, health care, and construction. For a comprehensive listing of occupations at each phase of the mining cycle, see pages 47 to 54 of this guide.

Health and Safety Coordinator

Description: The role of the health and safety coordinators is to ensure that all employees know, understand, and follow safety rules and procedures. They provide training in first aid, mine rescue, surface firefighting and confined space entry. They monitor industrial hygiene (measuring gases, dust, etc.) and conduct on-site safety inspections. A health and safety coordinator ensures healthy working conditions and sets safety rules. He or she promotes health and safety within the mine, designs programs to protect employees from workplace hazards and helps others to comply with health and safety requirements.
Employment Requirements: A certificate or diploma in Occupational Health and Safety is generally required.
Work Schedule: A health and safety coordinator often works typical office hours (Monday to Friday, 9am–5pm). However, these hours are sometimes extended to accommodate workers on other shifts.
Salary Range: $70,000 – $102,000 a year

Material Handlers

Description: Material handlers lift and move materials, products, machines and equipment. In the operations phase of mining, they conduct production activities such as counting, weighing, sorting, packing and unpacking. Handlers are often responsible for operating cranes and hoists to move the materials. They may also operate equipment to dump materials such as coal and ore into railway cars, trucks or other vehicles.
Employment Requirements: A grade 12 education is required. An individual should possess workplace reading and writing skills for this position.
Work Schedule: A material handler's work schedule will vary widely depending on the way in which each mine chooses to operate. In some mines, workers engage in shift work. In others, they work several long shifts in a row and then have several days off. It is also common, particularly if the mine is in a remote location, for an individual to work for several weeks at a time without days off, followed by a longer leave period.
Hourly Rate: $10 – $25

Warehouse Worker

Description: Warehouse workers are responsible for storing and issuing parts and supplies for use by the mine, and for outgoing shipments. They receive and sort incoming parts and supplies, store items in an orderly and accessible manner, process incoming requisitions and issue or distribute parts and supplies for internal usage. They maintain records of the amount, type and location of parts and supplies using a manual or computerized inventory system. They stock inventory, and receive and ship materials.
Employment Requirements: A warehouse worker generally requires a grade 12 level of education or less. He or she should possess workplace reading and writing skills.
Work Schedule: A warehouse worker's work schedule will vary widely depending on the location of the mine or exploration project, whether the work is seasonal, and the way in which each mine chooses to operate. Workers may engage in shift work, work several long shifts in a row and then have several days off, or even work for several weeks at a time without days off, followed by a longer leave period.
Salary Range: $45,000 – $68,000

Blaster

Description: Blasters load explosives, set fuses, and detonate explosives to produce desired blasting patterns and rock fragmentation. Blasters handle, store and transport explosives and accessories in accordance with regulations and ensure that safety procedures are observed. They perform mathematical calculations to determine rock vibration and they do field tests to determine the type and quantity of explosives required.
Employment Requirements: Experience as a blaster helper or heavy equipment operator is generally required. Drillers and blasters work together. Some companies may require further training and certification specific to blasters.
Work Schedule: A blaster's work schedule will vary widely depending on the location of the mine or exploration project, whether the work is seasonal, and the way in which each mine

chooses to operate. It is also common, particularly where the mine is in a remote location, for an individual to work for several weeks at a time without days off, followed by a longer leave period.
Hourly Wage: $26 – $40

Heavy Equipment Operators

Description: Heavy equipment operators operate a variety of equipment including: scoop trams, backhoes, bulldozers, loaders, graders. There are many different types of heavy equipment operators, including crusher operators, scraper operators, and power shovel operators.
Employment Requirements: A certificate, diploma and completion of an apprenticeship program in the area of Heavy Equipment Operator and/or Industrial Mechanics is usually required. Many heavy equipment operator positions require experience and/or on-the-job training.
Work Schedule: A heavy equipment operator's work schedule can vary greatly. In some mines, workers engage in shift work (days, afternoons, nights).
Hourly Rate: $23 – $53

Lab Technician

Description: Lab technicians are responsible for coordinating laboratory testing, sample preparation, and various chemistry procedures. They transcribe and analyze geophysical and survey data, prepare or supervise the preparation of rock, mineral or metal samples, and perform physical and chemical laboratory tests. In the closure phase they may conduct or assist in air and water quality testing and assessments, environmental monitoring and protection activities, and development of and compliance with land rehabilitation targets.
Employment Requirements: A technical degree is usually required. One can be accredited as a Chemical Technician, a Medical Technologist, or have a Chemistry degree. Experience is an asset.
Work Schedule: Most lab technicians are required to work during operation hours (days, afternoons, nights).
Salary Range: $45,000 – $66,000 a year

Metallurgical Engineer

Description: Metallurgical engineers develop ways of processing metals and converting them into useful products. They use their knowledge in the development and evaluation of products, processes, and equipment. Metallurgical engineers who work in extractive metallurgy are concerned with finding new and better ways of separating relatively small amounts of metal from huge quantities of waste rock. In physical metallurgy, the engineers develop processes to create alloys from the extracted metals. They design and supervise processes that separate metals from their ores, then further refine the metals using different processes that use heat, electric current, or chemicals. Metallurgical engineers are also often responsible for considering the environmental effects of the processes they use. They may work in an ore treatment plant, in a mill or in a laboratory using complex equipment such as electron microscopes, X-ray machines, and spectrographs.
Employment Requirements: A minimum of a bachelor's degree in Mining and Metallurgical Engineering or Earth Sciences is required.
Work Schedule: It is standard for metallurgical engineers to work 40-hour workweeks (Monday to Friday, 9am–5pm); however, some are required to work rotating shifts (days, afternoons, nights). Overtime is sometimes necessary in order to meet project deadlines.
Salary Range: $70,000 – $105,000 a year

Electrical Engineers

Description: Electrical engineers are responsible for planning and supervising a site's power generating equipment. They design, plan, research, evaluate, and test electrical and electronic equipment and systems. They use cutting edge

Q **WHERE CAN I ACCESS INFORMATION ABOUT APPRENTICEABLE TRADES?**

A *For a wealth of information on apprenticeable trades and links to provincial/territorial apprenticeship board websites visit www.apprenticetrades.ca*

technology and processes and provide technical leadership and troubleshooting to improve operational efficiency. Engineers are responsible for the equipment, machinery, and systems that are essential to mine functioning.

Employment Requirements: A bachelor's degree in Electrical Engineering is required. To work as a professional electrical engineer, professional certification is required.

Work Schedule: An electrical engineer usually works a 40-hour workweek (Monday to Friday, 9am–5pm); however, he or she could be required to work overtime hours if an issue with electrical equipment or electrical systems arises that interferes with production.

Hourly Rate: $22 – $55

C. EDUCATION AND TRAINING PROGRAM SHOWCASES

Mine Training Society (MTS)

Overview: With the goal of providing training and job opportunities for Aboriginal people in the north, the MTS was launched as an Aboriginal Skills and Employment Partnership (ASEP) program and receives ongoing supplementary support from its partners. Its mandate is to build awareness and strengthen the qualifications of potential employees while matching Northerners with the unprecedented growing number of jobs available in the mining sector. Partners are Yellowknives Dene First Nation, Tli Cho Government, Lutsel K'e Dene First Nation and the North Slave Métis Alliance, along with BHP Billiton Diamonds Inc., Diavik Diamond Mines, De Beers

PROFILE: Trudy Cayen — LOCATION: Northwest Territories

Position: Underground Miner

Trudy Cayen is the first woman to graduate from the Aboriginal Underground Mining Program offered by the Mine Training Society (MTS). Trudy grew up in Hay River, Northwest Territories where she completed high school and worked as a convenience store clerk and later a cook. Not content with working at these low-skilled and low-paying jobs, she applied to participate in the Underground Miner Training Program. The course included eight weeks of a combination of classroom and field training. On successful completion of the program, candidates were almost guaranteed employment with Procon, a mine service contractor.

Today, Trudy operates a 45-tonne truck hauling materials to and from the mine's surface. These are lucrative jobs and can pay upwards of $100,000 per year for the average underground mine worker. Most of the miners at the mine work three weeks followed by three weeks off work. The field shifts are demanding, with employees working 10 to 12 hours a day, seven days as week, but Trudy says it helps the shifts pass quickly.

The number of women in underground mining is slowly growing. Three women have already signed up for the next intake of MTS trainees. It seems other people are starting to see the attraction of underground jobs. Ron Burke, Trudy's supervisor, is a big fan of the program and has seen improvements in the quality of applicants over time. He said, "before the mines, a grade 12 education didn't make much of a difference in your lifestyle so kids couldn't be bothered. Today, grade 12 qualifies you for the mines, and this means a significant impact on your income and on your future."

The Mine Training Society is breaking down stereotypes. Trudy Cayen is one of only four female underground miners at BHP Billiton's Ek'ati Mine. Another three women have already applied for the next intake of underground mining trainees.

Source: Mine Training Society Final Report 2007, www.minetraining.ca (retrieved July 2, 2008)

Canada and the Government of the Northwest Territories. MTS solicits training proposals from members, local communities, the business community, Aboriginal joint ventures and non-governmental organizations.

Features:

- Training covers mineral processors and heavy equipment operators as well as security, mine reclamation and apprenticeship programs.
- An underground mining simulator
- Support for families, including childcare, while the participant is away in training
- Training often includes critical job and life skills, as well as financial and life management

For further information: *www.minetraining.ca*

British Columbia Aboriginal Mine Training Association

Overview: The impending labour shortage facing Canada's exploration and mining industry means companies across the country are looking for ways to attract and retain skilled workers. While the industry is the largest private sector employer of Aboriginal men and women, investment in education and training in the growing Aboriginal population will help to ensure a supply of skilled labour for the future and facilitate an increase in Aboriginal contributions to the Canadian economy.

With a focus on preparation and skills upgrading, BC AMTA is building capacity with, and for First Nations communities in

PROFILE: Aaron Campbell — LOCATION: Northwest Territories

Position: Mineral Processor

Aaron Campbell, son of a welder, withdrew early from school but later returned to upgrade his education at Aurora College, enrolling in a pre-employment welding training program. Like many trainees, Aaron found it difficult to find work as a welder and worked at a series of other jobs before learning of the Mineral Processing Program offered jointly by Diavik and Mine Training Society (MTS). The promise of an actual well-paying job following the training program was the primary driver for Aaron entering and successfully completing the program. "The real driver was money," said Aaron, "My first child had been born and I knew that I would get a paid job at the end of the program."

It proved to be an intensive six-month training program. Diavik had invested over $300,000 to have instructors from the Northern Alberta Institute of Technology develop a curriculum specifically to address the needs of the mining industry. Participants had to undergo three months of theoretical classroom training at Aurora College followed by three months on-the-job training at the Diavik mine. Twelve of the 16 participants graduated from the program. According to the 2007 MTS annual report, nearly three years after the program was established, 10 of the former trainees are still employed at the mine.

Within the context of Diavik's succession planning program, Aaron has been promoted three times and is closing in on working in the control tower. MTS reports that Aaron, at the age of 23 is earning an enviable six-figure salary. Aaron is the first to admit that money is not everything but acknowledges the spin-off benefits for his wife and children. According to MTS, Aaron's wife Heather does not have to work and is able to stay home to raise their three small children. She is also able to attend business management courses in her spare time and by the time the children are school age, Heather will be in a good position to start a career of her own.

Source: Mine Training Society 2007 Annual Report, www.minetraining.ca (retrieved June 30, 2008)

PROFILE: Catherine Mitsuk — LOCATION: Newfoundland & Labrador

Position: Mill Operator

Catherine (Cathy) Mitsuk, a 27 year-old Inuk from Hopedale, Labrador, is one valued employee at Vale, Voisey's Bay mine. Open pit mining and processing began in 2005 at this location in northern Labrador on a peninsula 35 kilometers southwest of Nain. Cathy is one of approximately 290 people employed in mine operations and she is playing an important role in the production of nickel and copper sulphide concentrates at the mine concentrator.

Cathy was first exposed to opportunities in mining when, in 2004, she took a five-week concrete training course in Voisey's Bay when the mine was still under construction. Her training superintendent encouraged her to further develop her employability skills by taking a Mining Technician program offered through the College of North Atlantic in Labrador City. This option appealed to Cathy and she decided that the two years of training would be a good investment of her time. She was able to access financial support through JETA (Joint Voisey's Bay Employment and Training Authority) and went on to develop specialized skills in operating a variety of production equipment and in maintenance work.

When describing her line of work, Cathy says, "Basically we oversee the equipment operations of five different circuits of the mill. We are responsible for the equipment and making sure everything is working in optimum performance." Cathy began her employment in January, 2007, and has already been promoted a couple of times. She started as a Mill Operator 5 (process helper) and, after mastering the skills required in two of the five different circuits of the mill, has moved up to Mill Operator 3. She anticipates mastering another circuit stage and moving up another level in the near future. Naturally, she appreciates the increase in income, and the ability to learn and teach new skills that come along with advancement. She also describes her work as "very hands on."

Working on a two-week in, two-week out rotation, Cathy is very grateful that she can live in her home community with her six year old son and has become accustomed to living in the camp and to the 45 minute flights to and from her place of work. She says, "After graduating from high school I never thought I'd be working in the mining industry but I really liked the course and the on-the job-training. I also had a great opportunity for a four-month paid work term with the Iron Ore Company as a Process Technician and one thing led to another. I did not have a clue about the industry, but the work term with IOC really broadened my horizons." She says her employer and colleagues are very supportive and she says it is a non-intimidating environment. The mine life at Voisey's Bay is expected to be at least 14 years and Cathy foresees herself working several more years in her "not an everyday job."

British Columbia. BC AMTA is an essential force in the hiring process for their partner mines. Programs include:

- *Mining Skills for an Entry-level Workforce:* BC AMTA has co-developed an Introduction to Mining Skills Certificate Program designed to familiarize students with the realities of the mining industry. Many components of this certificate program are based on safety, including First Aid, Workplace Hazardous Materials Information System (WHMIS) and working in confined spaces. Curriculum includes: Mining cycle, introduction to open pit and/or underground mining, mineral processing, industry certifications, communication and mine safety.
- *Underground Miner:* BC AMTA partnered with New Afton mine to offer a very successful Underground Mine Training program that includes orientation, safety, skills development, job-specific training and equipment use for the unique underground working environment.

- *Intro to Trades and Women in Trades:* BC AMTA students may have the opportunity to take the Industry Training Authority's Introduction to Trades course which introduces students to professional trades found across the mining industry. Participants in this program may also qualify for Foundations training, specific to one of the Trades that are in-demand in the mining industry. BC AMTA and its partners sometimes offer a "women only" version of this program which encourages women to get into the trades through a comfortable learning setting. Curriculum focuses on and introduces students to 6 industry related trades that could include: Electrical, Instrumentation Mechanic, Heavy Equipment Operation, Parts-person, Piping, Carpentry, Welding and Heavy Duty Mechanic.

For further information: *www.bcamta.ca*

Val d'Or Center for Professional Development

Overview: The Val-D'Or Center for Professional Development provides programs that assist students in acquiring the knowledge and skills required for certain careers in exploration and operations. The programs also prepare students to apply preventative measures and safety measures required in each occupation.

- The Mineral Extraction Program teaches students how to do secondary blasting, bolting of walls and work related to timbering, backfilling, mucking, drilling, and blasting of rock faces. Students must have a secondary studies diploma (DES); or be at least 18 years of age and have all the required prerequisites; and must obtain a General Explosives Permit
- The Machine Operations, Mineral Processing for Ore Treatment program teaches students how to fragment ore, evaluate milling and classification circuits, concentrate ore by floatation, produce gold ore concentrates by dissolving soluble materials. The program also teaches students appropriate techniques for the treatment and disposal of residues from the mineral concentration process. Students must have a secondary studies diploma (DES); or be at least 18 years of age and have all the required prerequisites;
- The Diamond Drilling program teaches students knowledge and skills unique to the diamond drilling industry. The program covers topics such as common geological terms communicated in the work place and explores techniques used in the transportation of materials and/or equipment. Students must have a secondary studies diploma (DES); or be at least 18 years of age and have all the required prerequisites; and must obtain a General Explosives Permit

Features:

- Scholarships are available. For further information contact the college's main office
- Programs focus on increasing the efficiency and safety of exploration and mining processes
- Provides a structured learning environment for mining related careers

For further information: *www.cfpvaldor.qc.ca*

CLOSURE/RECLAMATION

A. ACTIVITIES IN CLOSURE/RECLAMATION

Mine closure is the fourth and final stage of the mining cycle. When a site has run out of minerals to extract or if it is no longer profitable to mine a site, then the mine will close. Typically mine closure/mine rehabilitation lasts between two and ten years, but it can be much longer if long-term monitoring is required. Activities in this stage may include:

- shut-down, which involves the layoff or transitioning of most employees, and shutting down of the mine equipment;
- decommissioning, which involves taking apart the equipment and processing facilities;
- reclamation, which involves restoring the land to its pre-mine state as closely as possible; and
- post-closure activities, which involve monitoring the site to ensure reclamation was successful.

It should be noted that a number of the activities related to site closure and rehabilitation may begin in earlier stages of a mining project. For example, planning for site closure can often begin as early as the advanced exploration stage. Environmental monitoring takes place throughout the mining cycle. Employment in jobs related to closure and reclamation are therefore available throughout the life of a mine; however, the greatest number of opportunities for employment will occur in the final stages.

B. CAREERS IN CLOSURE/RECLAMATION

The following pages provide a brief description of several of the many occupations normally found in this phase including the typical activities, employment requirements, work schedules, and typical salary ranges. It is important to note

that salary ranges vary from region to region and will change over time. Users of the guide can check sources, such as *www.workingincanada.gc.ca*, *www.acareerinmining.ca*, job postings on employers' websites, and job banks (e.g. *www.pdacjobs.com*) for more information about salaries.

To create a balanced view of jobs across all skill levels, entry level, skilled, trades, technical and professional jobs are included. This job inventory is intended to highlight some key occupations of the estimated 120 occupations in mining. Some jobs are available in more than one of the mining phases. Contractors and suppliers also provide employment opportunities in various support services throughout the mining cycle. Some support services of particular importance to mine closure/ rehabilitation include cooking, tree planting, agriculture, hydrology, health and safety, and security. For a comprehensive listing of occupations at each phase of the mining cycle, see pages 47 to 54 of this guide.

Human Resources Manager

Description: Human Resources Managers are present throughout all phases of the mining cycle. Critical to the success of mine closure will be the management of staff and employees. As the mine approaches closure, human resources managers must coordinate a staged release of employees. It is critical to establish the skills that need to be retained in order to complete the tasks required.
This is the job of a human resources manager: to design the specialized workforce needed for a successful closure.
Employment Requirements: Human resources managers generally require a university degree in Industrial Relations or Human Resources. Often companies will require previous experience in human resources management.
Work Schedule: Human resources managers typically work a 40-hour workweek (Monday to Friday, 9am–5pm); however, they may be required to work extended hours, or even shift work to accommodate employees working on nights and afternoon shifts.
Salary Range: $109,000 – $156,000 a year

Civil Engineer

Description: Civil engineers are responsible for the development and implementation of mine closure measures. They review closure liabilities and serve as technical advisors in dealing with environmental complications during reclamation. In the closure phase, civil engineers are required to develop closure methods that are environmentally sound while using specific materials and providing permanent closure of mine openings. These engineers are required to consider costs, governmental regulations, and potential environmental hazards in decommissioning activities.
Employment Requirements: Civil engineers require a bachelor's degree in Civil Engineering.
Work Schedule: Civil engineers work typical workweeks (Monday to Friday, 9am–5pm); however, they may be required to work longer hours if pressured by deadlines. Additionally, many civil engineers work in a supervisory role during the closure process. Civil engineers with a supervisory role may be required to work similar hours to those whom they are supervising.
Hourly Rate: $21 – $54

Labourer

Description: Once production has come to an end, a small group of employees is tasked with permanently shutting down operations. Labourers are required to assist in decommissioning, which generally means the draining of hydraulic fluids and oils from mobile equipment, draining pipelines, cleaning up, disposing of waste, and removing equipment and parts. Labourers are often required for reclamation activities as well. This includes general landscaping, re-shaping the land, and restoring topsoil.
Employment Requirements: Minimal experience is required to become a mine labourer. A high school diploma is preferred.
Work Schedule: A labourer's work schedule in the closure phase will vary widely depending on the way in which each mine chooses to operate. At some sites, closure activities take place on an average workweek schedule (Monday to Friday, 9am–5pm), while at others, workers are expected to work shifts (days, afternoons, nights) or long hours in order to meet closure deadlines.
Hourly Rate: $14 – $40

Water Sampler

Description: A water sampler takes samples of water during different stages of a mine's cycle. During the mine closure

stage, water samplers are required to test water over time to ensure a mine site has been rehabilitated and that water pollution is not occurring after shut down. Samplers use water-quality testing equipment. Simple measurements can be taken in direct contact with the water source in question. More complex measurements that must be made in a lab setting require a water sample to be collected, preserved, and analyzed at another location.

Employment Requirements: A grade 12 level of education is generally required, along with proficiency in reading and writing.

Work Schedule: A water sampler can work a variety of different schedules. If their employment is tied to an operating mine, then they will likely be required to work during day, afternoon, and night shifts, and perhaps even work on a rotating schedule. If a water sampler is employed postclosure and their employment is not tied to an operating mine, for example if they are working for a municipal government, then the hours are likely to be closer to an average workweek (Monday to Friday, 9am–5pm).

Hourly Rate: $21 – $28

Environmental Monitor

Description: Environmental monitoring occurs at all phases of the mining cycle. License applications (for new mines/pits/quarries and expansions to existing operations) require environmental monitoring to gather base line data. A critical part of the closure/site rehabilitation phase is environmental monitoring. An environmental monitor makes observations, carries out routine inspections and collects environmental data (similar to a geological technician, but for the environment). An environmental monitor will examine the qualities of wildlife, fish, birds, vegetation and water.

Employment Requirements: A university degree in Mining, Environmental or Civil Engineering.

Work Schedule: Environmental monitors will, for the most part, be working typical office hours (Monday to Friday, 9am–5pm). Some may also work fl y-in/fl y-out schedules, depending on the mine site location.

Hourly Rate: $20 – $35

C. EDUCATION AND TRAINING PROGRAM SHOWCASES

Building Environmental Aboriginal Human Resources (BEAHR) Aboriginal Learning Institute

Overview: BEAHR, the result of a successful partnership between the Aboriginal Human Resource Council (AHRC) and ECO Canada, provides a range of programs in the environmental sector, including training and employment. Certificate programs available are the environmental monitor (EM) training program, and the environmental site assessment assistant training program. Both begin with 15 days of core skills training in five modules: foundation skills; introduction to the environmental sector; technical skills; health and safety; and local knowledge. On completion of the core skills training, students can continue in specialized modules (regulatory and research for EM) and environmental site assessment assistant modules. EMs are often required in mining operations at various stages and are individuals who observe the environment and the impacts of human and industrial activities, and communicate this information to various stakeholders. In addition to the core skills needed for all EM careers, there are two areas of specialization: regulatory, for those who monitor the activities of industry to ensure compliance with land-use or other environmental impact agreements, and research, for those who assist technicians/ technologists in monitoring various factors of the environment (i.e. wildlife counts, surveys or sampling).

Features:

- An instructional approach that combines traditional and scientific knowledge using formal and informal methods
- A great deal of community involvement – the community takes a lead on pre-screening and selection of students, engaging local employers, selecting its training provider, and determining the involvement of elders and other local knowledge holders who often assist the students during class and field instruction
- Enables the community to determine its own training providers (private or public), location, timing and engagement of employers that best suit its needs
- To be eligible, students are required only to have completed a minimum of grade eight

For further information: *www.beahr.com*

Environmental Monitor Assistant Program (EMAP)

Overview: The goals of the program are: to introduce students to Environmental Monitoring activities in a positive manner to encourage them to become involved in an entry level position in the Environmental Monitoring field, or pursue further training towards careers in this field; and to provide entry-level job skills that will enable students to pursue job positions, such as Environmental Monitor Field Assistants, in the mining or other natural resource sectors.

This is a practical, hands-on program where students gain entry-level job skills for environmental monitoring assistant positions in natural resource fields, including mineral exploration and mining. The program is delivered in a summer tent camp similar to those used in industry to provide students with realistic experiences of working conditions in the field. Students will be given safety training, and gain skills relevant to map, compass, GPS, computer, and archaeology.

Environmental monitor training will form a major part of the program, and will include introductions to data and sample collection, water sampling, hydrology, habitat descriptions (terrestrial and aquatic), wildlife surveys, environmental protection, and site rehabilitation. Various resource professionals, as well as First Nations Elders, will provide instruction. Students will gain job-readiness skills including time management, self-development, and conflict resolution. Certificates from the program will include WCB Occupational First Aid Level 1 and Transportation Endorsement, Bear Aware, Helicopter Safety, WHMIS, and NWCC Environ mental Monitor Assistant Certificate.

Features: The program takes place entirely on location in a remote bush camp and is taught by First Nations and other industry professionals. There is a resident First Nations Elder/ Cultural Teacher in the camp. The program is sponsored by the Smithers Exploration Group and the Province of BC.

For further information: *www.nwcc.bc.ca*

PROFILE: Rod Gardiner — LOCATION: Saskatchewan

Position: Senior Site Administrator

Rod Gardiner, a Métis from Île-à-la-Crosse, Saskatchewan, has been employed in mining for almost three decades. Currently a Senior Site Administrator at Areva Resource's Cluff Lake uranium mine, he has held many positions. Rod began as a labourer, which lasted only a week, and over the years he gained experience as an operator, lead hand, general foreman and service supervisor where he looked after the site maintenance crew and contractors including Clearwater Catering, and Sakitawak Development Corporation (SDC) Janitorial Services.

When asked how he started, Rod said, "The company was advertising and, through word of mouth, people were saying that the company paid good wages. I first went for an interview and started full time in July, 1980." Rod said it was a different lifestyle, "where you come out of the bush and then find yourself working among mine captains, engineers, electricians and journeymen."

Although not self-described, Rod is a role model and an advocate for "giving northerners a chance." Sometimes communicating in Cree with his colleagues on the job, which he says they are comfortable doing, Rod clearly has been a support to local employees. He speaks highly of the company's commitment to and investments in northerners. "Mining is a very good life for northerners," he says. "The seven days in, seven day out is good for family life."

Over the years, many workers have been transported to and from work in a 45 seat airplane from Buffalo Narrows. As a pick-up point, some workers would arrive in Buffalo Narrows by small plane from surrounding communities including Île-à-la-Crosse, Beauval, La Loche, Cold Bay, and Canoe Lake. A lot of employees have received training and developed skills that have enabled employment mobility to other mines in the region including Diavik, McClean Lake, McArthur River, Cigar Lake, Key Lake and Rabbit Lake.

Son of a commercial fisherman, Rod is a grandfather who still enjoys hunting, fishing and trapping. He is deservedly proud of the achievements of his children and speaks to the value of education. When asked about advice for young people Rod recommends finishing school. He says, "While there are all kinds of work opportunities, if you were to become a 'rock doctor' (geologist) or an engineer or a mechanic or a mine manager you will be in very high demand...you will never have to worry about having work."

While the Cluff Lake mine reached the end of its production in 2002 after a life of 22 years, most of the decom-missioning and rehabilitation was done in 2006. This included the planting of 750,000 trees, filling the Claude pit, demolishing the mill, and re-sloping and covering waste rock piles. Rod is one of the remaining eight people on site in the closure phase and is optimistic about the resource development and continued work in the area. He looks forward to another 15 years in his career and believes "mining in northern Saskatchewan is really promising."

PROFILE: Daniel Iqaqrialu — LOCATION: Nunavut

Position: Heavy Equipment Operator

Daniel Iqaqrialu, of Arctic Bay, has been working at the Nanisivik Mine on the Northern tip of Baffin Island, Nunavut, for approximately 12 years as a heavy equipment operator. Originally from Clyde River, Daniel moved to Arctic Bay with his family 20 years ago. Arctic Bay is a traditional Inuit community of approximately 700 people, 30 kilometers from the Nanisivik mine. Nanisivik Mine operated in the Arctic for 27 years until 2002 when the resource was exhausted. Since then, the company has been actively engaged in a reclamation project of the site.

At the mine, Daniel has worked as an underground miner, heavy equipment operator, and, after years of hard work and experience, a shift boss, supervising about 20 people during site reclamation. Now that the company is moving into post-closure monitoring activities, he will begin working elsewhere, operating heavy equipment at Mary River in Baffin Island, a nearby open-pit mine.

When he began work at the large, underground mine he was astounded to see what an underground mine, or “the underworld”, looks like. Daniel also really enjoys the surroundings. The colours of the land, the scenery, and the night landscape sometimes even keep him from sleeping because they are so beautiful.

Daniel believes that one of the most important things to remember about working in the mining industry is the importance of safety. He has had safety training at the mine and lives and works with this learning on a daily basis. At work, Daniel talks to people about safety and shows other employees the safest ways of operating machinery. Daniel has also received on-the-job training for heavy equipment operation and underground mining methods.

The Nanisivik mine has a history of Inuit employment from Arctic Bay, the local community, and from other settlements in Nunavut. Daniel hopes that other companies follow this lead and hire more Inuit employees. He also suggests that it is important to provide Inuit communities and individuals with training so they can benefit from the employment opportunities that the mining industry presents.

SKILLS DEVELOPMENT

Skills development is an essential element in meeting future mining labour market demands. Over the last decade, the Canadian mining industry has expanded the opportunities for individuals to develop skills needed for the mining industry. This has included the development of dedicated mining-related education programs at community colleges and universities as well as custom designed training programs operated by Aboriginal economic and human resources development institutions.

A recently approved project in Yukon Territory illustrates the elements of a “skills development” project. It involves many governmental and non- governmental partners. Through this initiative, the Yukon Mine Training Association (YMTA) has partnered with Human Resources and Social Development Canada, Aboriginal Affairs and Northern Development Canada, the Government of Yukon, industry and Aboriginal communities and other non-governmental organizations to develop and implement the “Partnership, People, and Production: Get into It” project. Through this project, Aboriginal people will gain the skills they need to succeed in the mining industry and other resource-based sectors in the Yukon.
www.yukonminetraining.com

This Yukon-based project offers a good model for other partnership arrangements that are inclusive and driven by Aboriginal communities themselves. Over the past decade, Aboriginal communities have become highly effective in leveraging resources and in working directly with industry to develop practical and results-oriented skills development and employment strategies.

JOB SHADOWING

Job shadowing is becoming more recognized and promoted in the mining sector. Several communities and private sector companies have established job shadowing opportunities in their workplaces. In many cases, job shadowing is an informal practice but is recognized as having significant potential in helping young people know what opportunities

are there for them and to raise overall awareness about these opportunities. If they are interested in establishing mining industry job shadowing initiatives, Aboriginal organizations might consider developing joint strategies with key industry representatives. This is one example of the practices that result in raising awareness and in generating interest about career opportunities in mining that communities can design and develop in line with community needs and aspirations.

MENTORSHIP PROGRAMS

Mentorship is a proven technique in Canada for increasing workers' employability and skills development. It is promoted by Aboriginal human resources development officials as a way of increasing skill levels by offering Aboriginal mentors, in a work environment, to those entering the workplace. Not only is this an opportunity for new employees to learn on the job, it is also an opportunity for them to share concerns and seek advice or assistance from those who are succeeding in that particular workplace. The Mining Industry Human Resources Council operates a virtual mentoring program for post secondary students and mine employees: *www.acareerinmining.ca*

MASTERING ABORIGINAL INCLUSION IN MINING

In today's tightening market it is important for the mining sector to be able to effectively adapt its workplace attraction, recruitment and retention approaches for Aboriginal people. There is a growing recognition in the industry that workplaces need to better access, accommodate and incorporate the untapped Aboriginal labour force. Specific strategies need to be in place. It is now widely acknowledged that the leading practice in recruiting and retaining Aboriginal workers is to ensure that the workforce is inclusive and that its policies reflect culturally appropriate approaches. To facilitate better attraction, recruitment and retention, human resources practitioners and other employment development organizations should engage with mining sector employers to update their human resources policies and practices.

A resource for this purpose is Mastering Aboriginal Inclusion in Mining. This tool, a product of Mining Industry Human Resources Council and the Aboriginal Human Resources Council, includes five modules:

- The Business Case for Aboriginal Inclusion
- History's Pendulum from Exclusion to Inclusion
- Communicating Across Cultures
- Recruitment, Retention and Advancement
- Partnerships and Alliances

Aboriginal Human Resources Council:
www.aboriginalhr.ca

CONFERENCES AND CAREER FAIRS

There are many ways that Aboriginal communities and mining interests have worked together. One of the best ways to become involved with mining associations and other industry players is to take part in a number of mining events that are held annually at the international, national and regional levels. Attendance at annual national and regional mining conferences can be a good starting point for communities interested in learning more about the mining industry and how to participate in mining. Information on the most notable national conferences can be found on the following national association websites:

- The Canadian Aboriginal Minerals Association (CAMA) at *www.aboriginalminerals.com*
- The Mining Association of Canada (MAC) at *www.mining.ca*
- The Prospectors and Developers Association of Canada (PDAC) at *www.pdac.ca*
- Canadian Institute of Mining, Metallurgy and Petroleum (CIM) at *www.cim.org*

KEY RESOURCES

MINING ESSENTIALS: A WORK READINESS TRAINING PROGRAM FOR ABORIGINAL PEOPLES

Mining Essentials is a pre-employment training program for Aboriginal peoples who are interested in exploring their career options in mining. The program teaches both the essential skills and work readiness skills that the mining industry requires to be considered for an entry-level position through industry examples and Aboriginal cultural methods. Mining Essentials provides a first step on a rewarding career path. For more information on the program, please visit: *www.aboriginalmining.ca*.

NETWORK FOR ABORIGINAL MINING EDUCATION

The Network for Aboriginal Mining Education is a group of educators, industry members, Aboriginal communities and others interested in improving the opportunities and successful education to employment outcomes of Aboriginal learners. To join the network, please visit: *www.aboriginalmining.ca*.

THE EXPLORATION AND MINING GUIDE FOR ABORIGINAL COMMUNITIES

A comprehensive guide on the mining sequence, this tool provides basic explanations of activities from early exploration through to mine closure, including regulatory processes, potential impacts and opportunities, and examples of successful Aboriginal community experiences and partnerships with the mining industry.

EXPLORE FOR MORE

Explore for More is a career awareness brand and suite of products developed by the Mining Industry Human Resources Council. The brand is available for licensing by provincial, territorial and regional organizations. The website provides extensive information on careers, training, education, and employers. It highlights information on the importance of mining to Canada. Resources include a Speaker's Bureau, a Speaker's Toolkit, Virtual MineMentor Program, career pathways and a video library. Also of interest are profiles and testimonials of individuals employed in mining: *www.acareerinmining.ca*.

MINING INFORMATION VIDEO: OUR COMMUNITY… OUR FUTURE: MINING AND ABORIGINAL COMMUNITIES

A video explaining the mining sequence in six modules, from geological mapping and early exploration through to mine development to closure and site reclamation. Can be viewed in French, Ojibwa, Cree, Oji-Cree and English: *www.nrcan.gc.ca/mining-materials*

JOB SEARCH TOOLKIT FOR ABORIGINAL YOUTH

This toolkit, produced by Aboriginal Affairs and Northern Development Canada as part of its Youth Employment Strategy, is a resource for assisting youth in searching for and finding the right employment opportunities. Included is information on the basics of applying for a job, helpful tips for the first day of work and making a great impression, as well as exercises young people can do to gain insight into their individual personalities, skills and talents. It provides some practical information about employment opportunities in a variety of sectors including mining and is a good tool for young people wanting to enter the workforce. The toolkit can be accessed online at AANDC's website: *www.aadnc-aandc.gc.ca.*

Occupations in Mining

The following list indicates the phases of the cycle where various employment opportunities in mining exist. The list also identifies the level of education and/or on-the-job training needed to work in these occupations. It is important to note that related work experience is also an asset or may be required, depending on each company's hiring practices. Please contact the companies in your area for more information.

EMPLOYMENT OPPORTUNITIES	EDUCATION/ ON-THE-JOB TRAINING (STANDARD)	PROFILED IN MINING INDUSTRY HUMAN RESOURCES GUIDE FOR ABORIGINAL COMMUNITIES	EXPLORATION	DEVELOPMENT	OPERATION	CLOSURE AND SITE REHABILITATION
ADMINISTRATORS & SUPPORT WORKERS						
Accounting Staff	Degree			■	■	■
Security Guard	Grade 12		■*	■	■	■
Administrative Assistant	Grade 12			■	■	■
Accommodation Provider	Contact employer + On-the-Job Training		■	■	■	■
Laundry Services	Grade 10		■	■	■	
Airport Maintenance/Support	Grade 12		■	■	■	
Catering	Food Preparation Course		■	■	■	■
Chef/Cook	Diploma		■	■	■	■
Kitchen Staff	Food Preparation Course		■	■	■	■
Administrative Staff	Diploma			■	■	■
Buyer	Grade 12			■	■	■
Bookkeeper	Diploma			■	■	■
Cost Accountant	Degree			■	■	■
Expediter	Contact employer + On-the-Job Training		■	■	■	■
HR Clerk	Degree/Diploma			■	■	■
HR Specialist	Degree/Diploma + Certification			■	■	■
HR Administrator	Degree/Diploma			■	■	■
Payroll Clerk	Diploma			■	■	
Procurement Clerk	Grade 12			■	■	■
Receptionist	Certificate/Diploma			■	■	

EMPLOYMENT OPPORTUNITIES	EDUCATION/ ON-THE-JOB TRAINING (STANDARD)	PROFILED IN MINING INDUSTRY HUMAN RESOURCES GUIDE FOR ABORIGINAL COMMUNITIES	EXPLORATION	DEVELOPMENT	OPERATION	CLOSURE AND SITE REHABILITATION
Senior Network Administrator	Degree/Diploma			■	■	
Travel Clerk	Grade 12			■	■	
Warehouse Clerk	Grade 12			■	■	
Medical Orderly/Paramedic	Degree/Diploma		■	■	■	■
Physician's Assistant	Degree/Diploma			■	■	■
Safety Specialist	Degree/Diploma			■	■	■
Janitor	Hazardous Materials Training		■	■	■	■
Warehouse Worker	Grade 12	Page 31		■	■	
MANAGERS						
General Manager	Degree		■	■	■	■
Environment Manager	Degree/Diploma			■	■	■
Human Resources Manager	Degree/Diploma	Page 38		■	■	■
Administration Manager	Degree/Diploma			■	■	■
Public and Corporate Affairs Manager	Degree		■	■	■	■
Financial Manager	Degree			■	■	
Marketing Manager	Degree			■	■	
Plant Manager	Degree			■	■	
Camp Manager	Previous Experience		■	■	■	■
Protective Services Operations Manager	Diploma			■	■	■
Safety Manager	Degree/Diploma			■	■	■
Mine Manager	Degree			■	■	
SUPERVISORS AND COORDINATORS Previous Work Experience is Required						
Employee Relations Coordinator	Degree/Diploma			■	■	
IT Supervisor	Degree/Diploma			■	■	
Training Coordinator	Degree/Diploma			■	■	
HR Coordinator	Degree/Diploma			■	■	■
Materials Management Superintendent	Degree/Diploma			■	■	

EMPLOYMENT OPPORTUNITIES	EDUCATION/ ON-THE-JOB TRAINING (STANDARD)	PROFILED IN MINING INDUSTRY HUMAN RESOURCES GUIDE FOR ABORIGINAL COMMUNITIES	EXPLORATION	DEVELOPMENT	OPERATION	CLOSURE AND SITE REHABILITATION
Mine Superintendent	Degree			■	■	
Production Supervisor	Certification			■	■	
Drill and Blast Supervisor	Certification			■	■	
General Supervisor	Degree/Diploma			■	■	
Plant Supervisor	Degree/Diploma			■	■	
Mechanical Supervisor	Degree/Diploma				■	■
Site Services Supervisor	Degree/Diploma			■	■	
Foreman	Diploma			■	■	
Sr. Security Supervisor	Diploma			■	■	■
Aboriginal Liaison	Grade 12		■	■	■	■
Environmental Coordinator	Degree/Diploma				■	■
Communications Coordinator	Diploma		■	■	■	■
Business Development Coordinator	Degree/Diploma		■	■	■	
Health and Safety Coordinator	Diploma/Certificate	Page 31		■	■	
Maintenance Supervisor	Diploma			■	■	
OPERATORS						
Pit Operator	On-the-Job Training			■	■	
Production Drill Operator	Grade 12 + On-the-Job Training			■	■	
Bulk Sample Plant Operator	Grade 12 + On-the-Job Training			■	■	
Central Control Room Operator	Grade 12 + On-the-Job Training				■	
General Maintenace and Dewatering Operator	Grade 12 + On-the-Job Training				■	
Laboratory Operator	Grade 12 + On-the-Job Training				■	
Recovery Operator	Grade 12				■	
Heavy Equipment Operators	Commerical Vehicle License + Heavy Equipment Operator Certificate	Page 32	■	■	■	■
Transportation and Freight Vehicle Operator	Commerical Vehicle License + On-the-Job Training		■	■	■	■

EMPLOYMENT OPPORTUNITIES	EDUCATION/ ON-THE-JOB TRAINING (STANDARD)	PROFILED IN MINING INDUSTRY HUMAN RESOURCES GUIDE FOR ABORIGINAL COMMUNITIES	EXPLORATION	DEVELOPMENT	OPERATION	CLOSURE AND SITE REHABILITATION
Helicopter/Aircraft Pilot	Commercial Pilot License		■	■	■	■
Crane Operator	Heavy Equipment Operator Certificate			■	■	■
Fuel Truck Driver	Commerical Vehicle License + On-the-Job Training			■	■	■
Grader Operator	Heavy Equipment Operator Certificate + On-the-Job Training			■	■	■
Haul Truck Driver	Commerical Vehicle License + On-the-Job Training			■	■	■
Loader Operator	Heavy Equipment Operator Certificate + On-the-Job Training			■	■	■
Truck Driver	Commerical Vehicle License + On-the-Job Training			■	■	■
Scoop-tram, Boom Operator	Heavy Equipment Operator Certificate + On-the-Job Training			■	■	
TECHNICIANS						
Lab Technician	Diploma	Page 32	■		■	■
IT Specialist/Technician	Degree/Diploma			■	■	
Driller	Grade 12 + On-the-Job Training	Page 18	■	■	■	
Drill Helper	Grade 12		■	■	■	
Blaster	Grade 12 + On-the-Job Training	Page 31		■	■	
Demolition Expert	Degree/Diploma + On-the-Job Training + Hazardous Materials/ Dangerous Goods Training			■	■	■
Explosive Manufacturer	Hazardous Materials/Dangerous Goods Training + On-the-Job Training			■	■	
Explosive Manufacturer Assistant	Hazardous Materials/Dangerous Goods Training + On-the-Job Training			■	■	
Miner	Grade 10 + On-the-Job Training			■	■	
Fuel Handler	Hazardous Materials/Dangerous Goods Training, Petroleum Mechanic Course		■	■	■	■
Labourer	Grade 10	Page 38	■	■	■	■

EMPLOYMENT OPPORTUNITIES	EDUCATION/ ON-THE-JOB TRAINING (STANDARD)	PROFILED IN MINING INDUSTRY HUMAN RESOURCES GUIDE FOR ABORIGINAL COMMUNITIES	EXPLORATION	DEVELOPMENT	OPERATION	CLOSURE AND SITE REHABILITATION
Material Handlers	Grade 12	Page 31		■	■	
Photographer	Diploma			■	■	■
Agricultural Specialist	Degree		■			■
Main Treatment Plant Engineer	Degree/Diploma				■	
Biologist	Degree		■			■
Environmental Monitor	Degree	Page 39		■	■	
Environmental Coordinator	Diploma or Experience	Page 19	■	■	■	■
Environmental Specialist	Degree/Diploma			■	■	■
Environmental Technician	Degree/Diploma				■	
Water Sampler	Grade 12	Page 38	■	■	■	■
Chemical Engineer	Degree		■	■	■	
Civil Engineer	Degree	Page 38		■	■	■
Electrical Engineers	Degree	Page 32		■	■	
Geological Engineer	Degree	Page 26	■	■	■	■
Mechanical Engineer	Degree	Page 25		■	■	
Metallurgical Engineer	Degree	Page 32		■	■	
Mining Engineer	Degree/Diploma	Page 25		■	■	
Process Engineer	Degree		■	■	■	
Mining Technician	Diploma	Page 25		■	■	
Water Management Technician	Degree/Diploma				■	■
Geochemist	Degree	Page 20	■	■	■	
Geologist	Degree/Diploma	Page 19	■	■	■	
Geophysicist	Degree		■	■	■	
Hydrogeologist	Degree/Diploma		■	■	■	
Metallurgist	Degree/Diploma			■	■	
Field Assistant	Grade 10 + On-the-Job Training		■	■	■	
Prospector	Grade 12 + On-the-Job Training	Page 18	■			
Sampler	Grade 10 + On-the-Job Training		■	■	■	

EMPLOYMENT OPPORTUNITIES	EDUCATION/ ON-THE-JOB TRAINING (STANDARD)	PROFILED IN MINING INDUSTRY HUMAN RESOURCES GUIDE FOR ABORIGINAL COMMUNITIES	EXPLORATION	DEVELOPMENT	OPERATION	CLOSURE AND SITE REHABILITATION
Landscape Specialist	Degree/Diploma					■
Tree Planter	Experience					■
Mining Technician	Diploma			■	■	
Claim Staker	Grade 12 + On-the-Job Training		■			
Line Cutter	Grade 12 + On-the-Job Training	Page 18	■			
Steel Erector	Grade 12 + Trades Certification			■	■	
Surveyor	Diploma/Certificate	Page 25			■	
Survey Technician	Diploma				■	
Carpenter	Grade 12 + Trades Certification		■	■	■	
Diesel Mechanic	Grade 12 + Trades Certification			■	■	
Drafting Technician	Diploma		■	■	■	
Electrician	Trades Certification		■			
GIS Technician	Diploma	Page 19		■	■	
High Voltage Electrician	Grade 12 + Trades Certification				■	
Instrumentation Technician	Diploma			■	■	
Machinists	Grade 12 + Trades Certification	Page 25		■	■	
Mechanic	Grade 12 + Trades Certification		■	■	■	■**
Millwright	Grade 12 + Trades Certification	Page 26			■	■**
Pipefitters	Grade 12 + Trades Certification			■	■	■**
Plumber	Grade 12 + Trades Certification			■	■	■**
Welder	Grade 12 + Trades Certification			■	■	■**

*Needed for the gold and diamond industry
**Position needed during specific time after mine closure and decommissioning

Resources and Contacts

NATIONAL ASSOCIATIONS & ORGANIZATIONS

MINING INDUSTRY HUMAN RESOURCES COUNCIL (MiHR)

Kanata, Ontario | Tel: 613-270-9696

www.mihr.ca

www.acareerinmining.ca

www.aboriginalmining.ca

MiHR is a leader in the development of solutions to national human resources challenges facing the mining industry. MiHR contributes to the strength, competitiveness and sustainability of the Canadian mining industry by collaborating with all the communities of interest in the development and implementation of solutions to the industry's national human resources challenges.

MINING ASSOCIATION OF CANADA (MAC)

Ottawa, Ontario | Tel: 613-233-9391

www.mining.ca

The Mining Association of Canada is a national organization of the Canadian mining industry. Its members are mining companies engaged in mineral exploration, mining, smelting, refining and semi-fabrication. MAC's mission is to promote, through the collective action of its members, the growth and development of Canada's mining and mineral-processing industry. MAC works closely with provincial and other industry groups across Canada and in other countries. In 2004, it launched Towards Sustainable Mining (TSM), a stewardship initiative that aims to sustain the industry's role as a leading economic player by increasing public trust in its ability to manage the environmental and social issues important to Canadians. MAC provides information about the mining industry to the media, and to schools and libraries.

PROSPECTORS AND DEVELOPERS ASSOCIATION OF CANADA (PDAC)

Toronto, Ontario | Tel: 416-362-1969

www.pdac.ca

The Prospectors and Developers Association of Canada is a national organization with over 7000 members representing the range of companies and individuals in mineral exploration and development. PDAC exists to protect and promote the interests of the Canadian mineral exploration sector and to ensure a robust mining industry in Canada; it encourages the highest standards of technical, environmental, safety and social practices in Canada and internationally. PDAC actively promotes greater participation by Aboriginal Peoples in the mineral industry as well as greater understanding and co-operation between Aboriginal communities and mineral exploration and mining companies.

CANADIAN ABORIGINAL MINERALS ASSOCIATION (CAMA)

Toronto, Ontario

www.aboriginalminerals.com

CAMA, an Aboriginal non-profit organization, promotes Aboriginal community economic development, mineral resource management, and environmental protection. By negotiating company partnerships for mineral exploration and development, Aboriginal communities can achieve economic self-sufficiency. Involvement with CAMA brings opportunities for networking with representatives from the mineral industry and the Aboriginal community. CAMA hosts regular conferences and other activities that may be of interest to communities involved in mining.

CANADIAN INSTITUTE OF MINING, METALLURGY AND PETROLEUM (CIM)

Montreal, Québec | Tel: 514-939-2710

www.cim.org

The Canadian Institute of Mining, Metallurgy and Petroleum is a technical society of professionals in the Canadian minerals, metals, and energy industries. The Institute is a forum for collaboration and knowledge sharing; learning and professional development are facilitated and a culture of achievement is fostered.

CANADIAN DIAMOND DRILLING ASSOCIATION (CDDA)

North Bay, Ontario | Tel: 705-476-6992

www.canadiandrilling.com

The CDDA supports the Canadian mineral industry by providing drill equipment and representational services. The CDDA lobbies government on behalf of the industry and keeps the companies informed on regulatory changes. The Association pinpoints industry areas which need further

research and development, and facilitates global networking within the industry.

CANADIAN LAND RECLAMATION ASSOCIATION

Calgary, Alberta | Tel: 403-289-9435

www.clra.ca

The Canadian Land Reclamation Association is a non-profit organization dedicated to reclaiming and rehabilitating disturbed lands such as previous surface mine sites. Members investigate problems and solutions in land reclamation, and are provided publishing opportunities for this information. The Association encourages movement from research stages to practical action on land reclamation, and rewards notable achievements in the field.

CanmetMATERIALS

Hamilton, Ontario | Tel: 905-645-0699

www.nrcan.gc.ca/mining-materials/materials-technology/8234

CanmetMATERIALS's mandate is to develop and deploy technologies to improve all aspects of producing and using value-added products derived from metals and minerals. Particular emphasis is placed on solving technological problems of relevance to Natural Resources Canada (NRCan)'s mandate in clean energy and sustainable development and on transferring materials technology to Canadian companies.

CANADIAN MINING INDUSTRY RESEARCH ORGANIZATION (CAMIRO)

Sudbury, Ontario | Tel: 705-673-6595

www.camiro.org

CAMIRO is a not-for-profit organization that manages collaborative mining research, and is voluntarily staff ed by members of the mining industry. The three research areas of CAMIRO are Exploration, Mining, and Metallurgical Processing. Each section's research improves technology and efficiency, contributing to the safety, profit, competitiveness, and growth of the Canadian mineral industry.

COAL ASSOCIATION OF CANADA

Calgary, Alberta | Tel: 403-262-1544 | 1-800-910-2625

www.coal.ca

The Coal Association of Canada provides a single authoritative voice in coal-related matters, promoting the use of coal as an environmentally and economically responsible energy source. Members include companies involved with exploration, development, mining, transportation and use of coal. The Association invites dialogue among members, with the resulting coordinated views disseminated publicly to government and media in an attempt to influence public perceptions of coal.

PROVINCIAL/TERRITORIAL ASSOCIATIONS & ORGANIZATIONS

MINING ASSOCIATION OF BRITISH COLUMBIA (MABC)

Vancouver, British Columbia | Tel: 604-681-4321

www.mining.bc.ca

The Mining Association of BC represents mineral producers, coal producers and companies involved in exploration, development and smelting of materials within the province. The Association's main role is to present industry information to the BC government to encourage policies conducive to a strong mining industry. Policy objectives include sustainable development and the inclusion of First Nations communities into resource development.

ASSOCIATION FOR MINERAL EXPLORATION BRITISH COLUMBIA (AME BC)

Vancouver, British Columbia | Tel: 604-689-5271

www.amebc.ca

The AME BC promotes environmentally responsible mineral exploration and mining in BC. The AME BC members are corporations and individuals with interests in the non-renewable resources sector. Their five-year strategic plan, created in 2007, prioritizes the need to lobby the government for reliable land access to encourage exploration. Another priority is the need for corporate responsibility in the industry.

ALBERTA CHAMBER OF RESOURCES

Edmonton, Alberta | Tel: 780-420-1030

www.acr-alberta.com

The Alberta Chamber of Resources is a group of organizations dedicated to the orderly development of Alberta's mineral resources. The Chamber has played a key role in raising the awareness of governments and the public about resource issues of importance to Alberta's economic, social and environmental well-being.

SASKATCHEWAN MINING ASSOCIATION (SMA)

Regina, Saskatchewan | Tel: 306-757-9505

www.saskmining.ca

The SMA exists to foster and preserve Saskatchewan's mining industry. It liaises with the government on behalf of the industry. Public education about sustainable mining practices is a priority, and the Association conducts its own industry-relevant studies.

MINING ASSOCIATION OF MANITOBA

Winnipeg, Manitoba | Tel: 204-989-1890

www.mines.ca

The Mining Association of Manitoba informs its members about public policy relevant to mining, while also influencing policy through its own roles in regulatory and licensing processes. The Association works to ensure legal clarity and efficacy of laws and processes related to the mining sector. Another focus is work safety in the mining industry. A sub-department focuses on injury prevention and helps to secure compensation for injured members.

ONTARIO MINING ASSOCIATION (OMA)

Toronto, Ontario | Tel: 416-364-9301

www.oma.on.ca

The OMA's members are environmentally-conscious mineral and exploring companies concentrated in Northern Ontario. The OMA serves as a conduit between industry and government, and industry and the public. The Association promotes mining to the public and offers educational resources to its members and the public alike. The OMA helps industry heads understand relevant legislation, while representing industry interests to policy makers.

ONTARIO PROSPECTORS ASSOCIATION

Thunder Bay, Ontario | Tel: 807-622-3284

www.ontarioprospectors.com

The objectives of the Ontario Prospectors Association are to represent and further the interests of the mineral exploration industry and the interests of prospectors. Its mission is to enhance and promote the Ontario mineral exploration and development community to foster a healthy mining industry.

BOREAL PROSPECTING ASSOCIATION (BPA)

Thunder Bay, Ontario | BorealProspectors@hotmail.com

www.ontarioprospectors.com/boreal

It is the intent of this Association to engage and support individual northern prospectors and to facilitate community-industry interaction by encouraging capacity building and mutual understanding. The BPA will represent and further the interests of its members in order to promote mineral exploration as an important economic base for sustainable development in Northern Ontario.

LE COMITÉ SECTORIEL DE MAIN-D'OEUVRE DE L'INDUSTRIE DES MINES

Québec City, Québec | Tel: 418-653-9254

www.csmomines.qc.ca

Le Comité Sectoriel de Main-d'oeuvre de l'Industrie des Mines responds to the challenges and issues of the mining industry's human resources. The committee is supported by Emploi-Québec and its industry partners.

QUÉBEC MINING ASSOCIATION (QMA)

Québec City, Québec | Tel: 418-657-2016

www.amq-inc.com

The QMA's members make up most of the province's mining and mineral workers: companies in metallurgy, exploration, contracting, and metal and mineral mining.The QMA supports its members through research, services, and government

lobbying. The Association encourages member partnerships between the mining industry and Aboriginal communities.

ASSOCIATION DE L'EXPLORATION MINIÈRE DU QUÉBEC (AEMQ)

Rouyn-Noranda, Québec | Tel: 819-762-1599

www.aemq.org

L'Association de l'exploration minière du Québec (AEMQ) is a non-profit organization. AEMQ represents all those involved in mining exploration in Québec.

NEW BRUNSWICK MINING ASSOCIATION

Moncton, New Brunswick | Tel: 506-857-3056

The New Brunswick Mining association, a provincial association, works closely with the overarching Mining Association of Canada (see previous page).

MINING ASSOCIATION OF NOVA SCOTIA

Bedford, Nova Scotia | Tel: 902-406-7625

www.tmans.ca

The Mining Association of Nova Scotia is a provincial organization representing over 100 member companies in all areas of mining — exploration, discovery, development, production and reclamation as well as consultants and suppliers to the industry. The association represents an industry that employs more than 6300 persons and contributes nearly $490 million to the provincial GDP.

NORTHWEST TERRITORIES AND NUNAVUT CHAMBER OF MINES

Yellowknife, Northwest Territories | Tel: 867-873-5281

www.miningnorth.com

The Chamber of Mines serves as the voice of the northern mining industry, promoting the territories' sector locally and internationally. Besides promotion, it serves an advisory role to governments, investors, universities, and the media, briefing them on industry stances and strategies. Issues the council continues to bring before the government are those specific to the locale: land alienation, lack of infrastructure support, and the role of mining in northern development.

YUKON CHAMBER OF MINES

Whitehorse, Yukon | Tel: 867-667-2090

www.yukonminers.ca

The Yukon Chamber of Mines represents a dynamic membership and since its creation almost 70 years ago, has worked to serve its valued members and advance the interests of all those involved in the Yukon mining industry. As the trusted voice of mining, the Yukon Chamber of Mines thrives on the government, community, First Nation and individual partnerships it forges to help facilitate an environment of responsible development - one in which its members can continue to contribute and prosper.

YUKON MINE TRAINING ASSOCIATION (YMTA)

Whitehorse, Yukon | Tel: 867.633.6463

www.yukonminetraining.com

The Yukon Mine Training Association (YMTA) is a link between Yukon First Nations and Yukon's mining and resource-related industries. The central goal of the Association is the training and development of a skilled workforce made up of First Nations and Yukoners to meet the current and future needs of the mining and resource sectors.

ABORIGINAL SKILLED WORKERS ASSOCIATION (ASWA)

Regina, Saskatchewan | Tel: 1-888-889-0130

www.aswa.ca

The Aboriginal Skilled Workers Association is a non-profit corporation working to promote and protect the interests of Aboriginal workers. The vision of ASWA is to create, develop and promote a united group of highly skilled, fairly compensated and respected Aboriginal workers supporting their families in healthy communities. ASWA works with government, employers, training institutions, Aboriginal communities and other supportive organizations to identify the skills in the Aboriginal workforce and to bridge these workers to employment opportunities suited to their skills and career goals. The Association manages a hiring hall referral service for contractors and other employers seeking to access skilled

workers from a pool of qualified members.

UNIONS

CANADIAN AUTOWORKERS UNION (CAW)

Toronto, Ontario | Tel: 416-497-4110 | 1-800-268-5763

www.caw.ca

CAW is the largest private-sector national union. It has members from varied industries including mining. CAW brings its bargaining power to environmental, social, and justice issues. Racial equality is emphasized within the organization's structure and programs, which include Aboriginal/Workers of Colour conferences.

COMMUNICATIONS, ENERGY AND PAPERWORKERS UNION OF CANADA (CEP)

Ottawa, Ontario | Tel: 613-230-5200 | 1-877-230-5201

www.cep.ca

The CEP negotiates with companies and lobbies governments to achieve the most favourable working conditions for Canadians. Their structure incorporates many local branches to foster grassroots participation. Regular publications keep the membership informed about on-the-job safety and health issues.

UNITED STEELWORKERS OF AMERICA (USWA) – CANADA

Toronto, Ontario

Tel: 416-487-1571

www.usw.ca

The Steelworkers represent workers from all regions and all industries of Canada. The union negotiates for fair wages and workplace justice, and offers a pension plan.

CONSTRUCTION MAINTENANCE AND ALLIED WORKERS (CMAW)

Vancouver, British Columbia | Tel: 604-437-0471

www.cmaw.ca

CMAW is a union of over 7000 members including carpenters, carpenter apprentices, lathers, millwrights, industrial workers and many other construction trades employees. It is the largest union representing construction workers in British Columbia.

LABOURERS' INTERNATIONAL UNION OF NORTH AMERICA (CANADA)

Hamilton, Ontario | Tel: 905-522-7177

www.liuna.ca

The Central and Eastern Canada Region of this union includes locals in Ontario, Québec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador.

UNITED MINE WORKERS OF AMERICA (UNWA)

Glace Bay, Nova Scotia | Tel: 902-849-8692

www.umwa.org

UNWA is a North American labour union that represents workers in mining. Members includes coal miners, clean coal technicians, health care workers, truck drivers, manufacturing workers and public employees throughout the United States and Canada.

GOVERNMENT DEPARTMENTS – PROVINCIAL/TERRITORIAL

BRITISH COLUMBIA MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

Vancouver, British Columbia | Tel: 1-800-663-7867

www.gov.bc.ca/ener/index.html

The ministry's aim is to develop and sustain a competitive mineral resource sector for British Columbians. The BC Mining Plan prioritizes the creation of a strong industry with more jobs for Aboriginal people and communities.

ALBERTA DEPARTMENT OF ENERGY

Edmonton, Alberta | Tel: 780-427-7425

www.energy.gov.ab.ca

The Alberta Department of Energy ensures that the energy and mineral sectors remain competitive and successful. The department manages exploration rights and implements development and royalty policies.

SASKATCHEWAN INDUSTRY AND RESOURCES

Saskatoon, Saskatchewan | Tel: 306-933-5751
www.ir.gov.sk.ca
The mandate of Saskatchewan Industry and Resources is to implement government policies that encourage sustainable growth in the province's resource sector.

MANITOBA MINERAL RESOURCES

Tel: 1-866-223-5215 | Mineral Resources Division
www.gov.mb.ca/iem/index.html
The Manitoba Mineral Resources aims to build the capacity for Manitobans to prosper through innovation, by creating strategic partnerships, encouraging investment, enabling equitable access to the right tools, promoting awareness and knowledge, and championing critical policy development.

ONTARIO MINISTRY OF NORTHERN DEVELOPMENT AND MINES

Sudbury, Ontario | Tel: 705-670-5755, 1-888-415-9845
www.mndm.gov.on.ca
The Ministry encourages investment and development into exploration of Northern Ontario's portion of the mineral-rich Canadian Shield. The Ministry offers information on mining as it relates to First Nations.

QUÉBEC DEPARTMENT OF NATURAL RESOURCES/RESOURCES NATURELLES ET FAUNE QUÉBEC

Québec City, Québec | Tel: 418-627-8600
www.mrnf.gouv.qc.ca/english/mines/index.jsp
Quebec's Department of Natural Resources aims to attract investors to Quebec's mining industry. Quebec employs incentives, like the free mining policy, to encourage increased metal and mineral exploration.

NEW BRUNSWICK DEPARTMENT OF NATURAL RESOURCES

Fredericton, New Brunswick | Tel: 506-453-2206
www.gnb.ca/0078/minerals/index-e.aspx
The Department's Minerals and Petroleum Unit manages the development of New Brunswick's energy and mining industries. Financial incentives, in conjunction with geological and technical services, are offered to companies to encourage exploration and development.

NOVA SCOTIA DEPARTMENT OF NATURAL RESOURCES

Halifax, Nova Scotia | Tel: 902-424-5200 | 1-800-670-4357
www.gov.ns.ca/natr
The Nova Scotia Department of Natural Resources works to manage and develop the province's resource industries. Proper stewardship and scientific understanding are emphasized, with the efficient use of resources the foremost goal.

PEI DEPARTMENT OF DEVELOPMENT AND TECHNOLOGY

Charlottetown, Prince Edward Island | Tel: 902-368-4000
www.gov.pe.ca/development/eam-info/index.php3
This department's Energy and Minerals Unit creates and implements policies relating to a sustainable future for PEI's natural resources. The unit is responsible for the administration of mineral resources development.

NEWFOUNDLAND AND LABRADOR DEPARTMENT OF MINES AND ENERGY

St. John's, Newfoundland
www.nr.gov.nl.ca/mines&en/mining
Mines and Energy promotes and facilitates the sustainable development of the province's mineral and energy resources through its resource assessment, management and development activities for the overall benefit of the citizens of Newfoundland and Labrador.

NUNAVUT – DEPARTMENT OF ECONOMIC DEVELOPMENT AND TRANSPORTATION

Iqaluit, Nunavut | Tel: 867-975-7800

www.gov.nu.ca

The Department of Economic Development and Transportation, like other Government of Nunavut Departments, operates on principles of Inuit Qaujimajatuqangit (IQ) and aims to "put people first, helping to build healthy communities and the infrastructure they need to link to each other, to the rest of Canada, and to the world." Information on how and where to invest in Nunavut's growing sectors as well as a map showing mineral exploration and mining in Nunavut is available online.

NORTHWEST TERRITORIES DEPARTMENT OF INDUSTRY, TOURISM AND INVESTMENT

Yellowknife, Northwest Territories

www.iti.gov.nt.ca

The Department is a source of information and expertise about non-renewable resources in the Northwest Territories. It promotes investment in, and development of these resources.

YUKON DEPARTMENT OF ENERGY, MINES AND RESOURCES

Whitehorse, Yukon | Tel: 867-667-3130

www.emr.gov.yk.ca

Energy, Mines and Resources works with local industry to promote sustainable development of the Yukon's natural resources. The Minerals Resource branch regulates resource use and exploration with the future always in mind.

GOVERNMENT DEPARTMENTS – FEDERAL

EMPLOYMENT AND SOCIAL DEVELOPMENT CANADA (ESDC)

Phase IV – Promenade du Portage | Gatineau, Québec

www.esdc.gc.ca/

A variety of tools to help learners, practitioners and employers develop approaches to literacy and essential skills development are offered including links to assessment tools, learning tools and training supports. Funding programs that support labour force development are offered including the Aboriginal Human Resources Development Strategy, Workplace Skills Initiative, Grants for Occupational Health and Safety, and the Adult Learning, Literacy and Essential Skills Program. HRSDC provides information about trades and apprenticeship and is host to an Essential Skills website.

More information available at: Aboriginal Skills and Employment Partnership Program (ASEP)
www.edsc.gc.ca/eng/jobs/aboriginal/asets/index.shtml

NATURAL RESOURCES CANADA (NRCAN) – MINERALS AND METALS SECTOR (MMS)

Ottawa, Ontario | Tel: 1-800-267-0452

www.nrcan.gc.ca/mining-materials

The Minerals and Metals Sector (MMS) of Natural Resources Canada (NRCan) is the federal government's main source of minerals- and metals-related economic and scientific knowledge, including statistics, sustainable development, commodities, technological expertise, and policy advice. MMS works with other federal departments and agencies to ensure that federal policies and strategies that have an impact on the minerals and metals industry are consistent with sustainable minerals development and use in Canada and around the world.

More information available at:
Exploration and Mining Guide for Aboriginal Communities
www.nrcan.gc.ca/mining-materials/aboriginal/bulletin/7823

ABORIGINAL AFFAIRS AND NORTHERN DEVELOPMENT CANADA (AANDC)

Gatineau, Québec | Tel: 1-800-567-9604

www.aadnc-aandc.gc.ca

AANDC is one of the federal government departments responsible for meeting the Government of Canada's obligations and commitments to First Nations, Inuit and Métis, and for fulfilling the federal government's constitutional responsibilities in the North. AANDC's responsibilities are largely determined by numerous statutes, negotiated agreements and relevant legal decisions. Most of the Department's programs, representing a majority of its spending – are delivered through partnerships with Aboriginal communities and federal-provincial or federal-territorial agreements. AANDC also works with urban Aboriginal people,

Métis and Non-Status Indians (many of whom live in rural areas).

SERVICE CANADA

Ottawa, Ontario | Tel: 1-800-O-Canada

www.servicecanada.gc.ca

www.youth.gc.ca

Service Canada provides a range of job creation, labour market partnerships, employment assistance and skills development programs. It also offers a range of products and services focused on youth. Youth Info Line provides information about opportunities available through the Youth Employment Strategy including the Summer Work Experience Program and Skills Link. The website provides information about Canada's Apprenticeship Incentive Grant as well as links to Service Canada Centers in each of the provinces and territories.

ENVIRONMENT CANADA

Gatineau, Québec

Tel: 1-800-668-6767

www.ec.gc.ca

Environment Canada's mandate is to preserve and enhance the quality of the natural environment, conserve Canada's renewable resources, and coordinate environmental policies and programs for the federal government.

Post-Secondary Education Options for Mining Careers

GEOLOGY, ENVIRONMENTAL AND EARTH SCIENCES

Geologists and earth scientists work closely with other workers in a mine and on exploration sites. They explore and research the structure, processes, and composition of the earth.

Institution	Location	BSc or BASc	MSc or MASc	PhD	Graduate Diploma
University of Alberta	Edmonton, Alberta	■	■	■	
Université du Québec à Chicoutimi	Chicoutimi, Québec	■	■	■	■
Acadia University	Wolfville, Nova Scotia	■	■		
Brandon University	Brandon, Manitoba	■	■		
Brock University	St. Catharines, Ontario	■	■		
Carleton University	Ottawa, Ontario	■	■	■	
Dalhousie University	Halifax, Nova Scotia	■	■	■	
Lakehead University	Thunder Bay, Ontario	■	■		
Laurentian University	Sudbury, Ontario	■	■	■	
Malaspina University-College	Nanaimo, British Columbia	■			
McGill University	Montréal, Québec	■	■	■	
McMaster University	Hamilton, Ontario	■	■	■	
Memorial University of Newfoundland	St. John's, Newfoundland	■	■	■	
Queen's University	Kingston, Ontario	■	■	■	
Saint Mary's University	Halifax, Nova Scotia	■			
Simon Fraser University	Vancouver, British Columbia	■	■	■	
St. Francis Xavier University	Antigonish, Nova Scotia	■	■		
Thompson Rivers University	Kamloops, British Columbia	■	■		
Université du Québec à Montréal	Montréal, Québec	■	■	■	
Université Laval	Québec City, Québec	■	■	■	
University of British Columbia	Vancouver, British Columbia	■	■	■	
University of Calgary	Calgary, Alberta	■	■	■	
University of Guelph	Guelph, Ontario	■	■		
University of Manitoba	Winnipeg, Manitoba	■	■	■	
University of New Brunswick	Fredericton, New Brunswick	■	■	■	
University of Ottawa	Ottawa, Ontario	■	■	■	
University of Regina	Regina, Saskatchewan	■	■	■	
University of Saskatchewan	Saskatoon, Saskatchewan	■	■	■	
University of Toronto	Toronto, Ontario	■	■	■	
University of Victoria	Victoria, British Columbia	■	■	■	
University of Waterloo	Kitchener/Waterloo, Ontario	■	■	■	
University of Western Ontario	London, Ontario	■	■	■	
University of Windsor	Windsor, Ontario	■	■	■	
York University	Toronto, Ontario	■	■	■	

MATERIALS AND METALLURGICAL ENGINEERING

Materials and metallurgical engineering applies knowledge of the structure and properties of metals and non-metallic materials to the development of new materials for industrial applications and everyday life. Metallurgical engineering also includes the development of advanced processing to refine extraction and concentrate of metals and other materials.

Institution	Location	BSc or BASc	MSc or MASc	PhD	Graduate Diploma
Dalhousie University	Halifax, Nova Scotia	■	■	■	
École Polytechnique de Montréal	Montréal, Québec	■	■	■	■
McMaster University	Hamilton, Ontario	■	■	■	
University of Alberta	Edmonton, Alberta	■	■	■	
University of British Columbia	Vancouver, BC	■	■	■	
University of Toronto	Toronto, Ontario		■	■	
Université Laval	Québec City, Québec	■	■	■	

MINE AND MINERAL ENGINEERING

Mine and mineral engineers are responsible for the planning, preparation, design and construction of a mine, its facilities and the extraction of all metal and non-metallic materials.

Institution	Location	BSc or BASc	MSc or MASc	PhD	Graduate Diploma
University of Alberta	Edmonton, Alberta	■	■	■	
Dalhousie University	Halifax, Nova Scotia	■	■	■	
École Polytechnique de Montréal	Montréal, Québec	■	■	■	■
Laurentian University	Sudbury, Ontario	■	■	■	
McGill University	Montréal, Québec	■	■	■	■
Queen's University	Kingston, Ontario	■	■	■	
Université du Québec en Abitibi-Témiscamingue	Amos, Québec		■		■
Université Laval	Québec City, Québec	■	■	■	
University of British Columbia	Vancouver, British Columbia	■	■	■	
University of Toronto	Toronto, Ontario	■			

COLLEGE PROGRAMS

Many careers exist within exploration and operations that are essential to the development of the goods that we use every day. A few examples of these careers include: geomatic technicians, prospectors, blasters, drillers, technicians and technologists. You can also "earn while you learn" by taking an apprenticeship. Visit *www.apprenticetrades.ca* for more information.

Institution/*Location*	Program Name	Diploma	Certificate	ROA*
Assiniboine Community College *Brandon, Manitoba*	Geographic Information Systems Environmental Technologies	■		
Aurora College *Fort Smith, Northwest Territories*	Introduction to Underground Mining		■	
	Underground Miner Training Program		■	
British Colombia Institute of Technology *Vancouver, British Columbia*	Mining & Mineral Exploration Technology	■		
	Natural Resources		■	
	Geomatics Engineering Technology	■		
Cambrian College of Applied Arts and Technology *Sudbury, Ontario*	Mining Certificate		■	
	Mining Engineering Technician	■		
	Mining Engineering Technologist	■		
Camosun College *Victoria, British Columbia*	Advanced Diploma in Mining Engineering Bridge	■	■	
Cégep de l'Abitibi-Témiscamingue *Rouyn-Noranda, Québec*	Technologie Minérale	■		
Cégep de l'Outaouais *Gatineau, Québec*	Géomatique, spécialisation en cartographie	■		
Cégep de Thetford *Thetford, Québec*	Technologie Minérale – Exploitation Minéralurgie	■		
Cégep de Trois-Rivières *Champlain, Québec*	Technologie du Génie Métallurgique – Contrôle des matériaux	■		
	Fabrication Mécanosoudée	■		
	Procédés de Transformation	■		
Cégep Limoilou *Québec, Québec*	Technologie de la Geomatique/Cartographie	■		
Collège Boréal *Sudbury, Ontario*	Construction Technician in Mining and Civil Engineering	■		
College of the North Atlantic *Labrador City, Labrador*	Mining Technician	■		
College of the North Atlantic *St. John's, Newfoundland*	Geomatics/Surveying Engineering Technology (Co-op)	■		
College of the Rockies *Cranbrook, British Columbia*	Mining Apprenticeship Program (Heavy Duty/Electric)		■	
Fleming College *Peterborough, Ontario*	Geographic Information Systems – Applications/ Cartographic Specialist	■		
Haileybury School of Mines *Haileybury, Ontario*	Mining Engineering Technician	■		
	Instrumentation Engineering	■		
Loyalist College *Belleville, Ontario*	Survey Engineering Technician	■		

Institution/*Location*	Program Name	Diploma	Certificate	ROA*
Lethbridge College *Lethbridge, Alberta*	Geomatics Engineering Technology	■		
	Environmental Assessment and Restoration	■		
New Brunswick Community College *Moncton, New Brunswick*	Geographic Information Systems Technology	■		
Northern Alberta Institute of Technology *Edmonton, Alberta*	Geological Technology	■		
Northern College of Applied Arts and Technology *Timmins, Ontario*	Mining Engineering Technician	■		
Northlands College *La Ronge, Saskatchewan*	Mine Training – Exploration	■		
	Technician Training	■		
	Trades and Vocations	■		
Northwest Community College *mulitple campuses in Northwest, BC*	Heavy Equipment Operator Technician		■	
	Applied Earth and Environmental Studies		■	
Northwest Community College – School of Exploration and Mining *Smithers, BC*	Camp Operations and Maintenance			■
	Drill Core Technician Basic Training			■
	Environmental Monitor Assistant Program			■
	Mining Exploration Field Assistant			■
	Surface Diamond Driller's Helper			■
	Prospector Basic Training			■
	Metal Leaching/Acid Rock Drainage			■
Nova Scotia Community College *Halifax, Nova Scotia*	Survey Technician		■	
	Geographic Information Systems Technician	■		
	Geomatics Engineering Technology	■		
Nunavut Arctic College *Baffin Island Region, Nunavut*	Introductory Mine Training			■
	Mineral Exploration Field Assistant			■
Red River College *Winnipeg, Manitoba*	Geographic Information Systems Technology	■		
SAIT Polytechnic *Calgary, Alberta*	Bachelor of Applied Geographic Information Systems, Geomatics Engineering Technology	■		
Saskatchewan Institute of Applied Science and Technology (SIAST) *Prince Albert, Saskatchewan*	Underground Miner		■	
	Geomatics Technology	■		
Southeast Regional College *Weyburn, Saskatchewan*	Geographic Information Science for Resource Management		■	
	Engineering Technology: Mining Engineering	■		
Yukon College *Whitehorse, Yukon*	Survey Technician		■	
	Environmental and Conservation Sciences (Degree)			■

*Record of achievment

PETROLEUM AND GEOLOGICAL ENGINEERING

A career as a petroleum engineer can take you all over the world. Petroleum engineers develop, plan, study and monitor the extraction of oil and gas deposits at oil refi neries and drilling spots. As a petroleum engineer there is the opportunity to specialize in drilling, production and reservoir analysis.

Geological engineers conduct geological and geotechnical studies to determine the suitability of locations for new mine developments.

Institution	Location	BSc or BASc	MSc or MASc	PhD	Graduate Diploma
University of Alberta	Edmonton, Alberta	■	■	■	
Dalhousie University	Halifax, Nova Scotia		■		
Memorial University of Newfoundland	St. John's, Newfoundland		■		■
University of Calgary	Edmonton, Alberta	■	■	■	
University of Regina	Regina, Saskatchewan	■	■	■	
Queen's University	Kingston, Ontario	■	■	■	
University of Waterloo	Waterloo/Kitchener, Ontario	■			
University of New Brunswick	Fredericton & Saint John, New Brunswick	■			
University of Saskatchewan	Saskatoon, Saskatchewan	■			
University of British Columbia	Vancouver, BC	■	■	■	

Admission Requirements and Prerequisites

For geology, earth and environmental earth sciences programs, the entrance level average ranges between 65%-75%. Prerequisite courses normally include, but are not limited to, advanced or university-level Math, Calculus, Physics, Biology and/or Chemistry. Graduate and Doctoral admission requirements for engineering, and geology, earth and environmental sciences are specific to the program, faculty and institution of study.

Generally, for engineering programs the minimum entrance level average ranges between 75%-85%. Prerequisite courses normally include, but are not limited to, advanced or university-level math, calculus, physics, biology, and/or chemistry. Generally, admission into college mining operation programs throughout Canada requires a high school diploma or mature student status. Most also require the applicant to be 18 years of age or older. Strong math comprehension skills are an asset.

For information about university programs in your area, visit the Association of Universities and Colleges at *www.aucc.ca*. For information about college programs in your area, visit the Association of Canadian Community Colleges at *www.accc.ca*.

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

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