



2014

Nunavut Mining Hiring Requirements and Available Talent Forecasts



Prepared for and in partnership with the Government of Nunavut.



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1. Introduction and Overview

1. Introduction and Overview



Nunavut's mining industry has gained momentum in recent years. Since the turn of the last decade, mining has emerged as a significant economic contributor and is anticipated to bring employment opportunities for the people of Nunavut. Much of the industry's continued growth will rely on its ability to attract and retain key talent, even with a more moderate economic outlook — declining commodity prices and cautious capital markets — the industry is expected to face significant human resource challenges in the coming years. The territory currently supports one operating mine, with another completing construction and nearing full production, as well as a number of advanced development and exploration projects.

Nunavut has unique labour market challenges: the extraction sector is emerging and production activities are new over the past few years; mining reserves are located in one of the most remote regions of the world; employers currently rely on a large contingent of workers who live in other provinces, giving rise to a substantial commuter workforce; and the local workforce generally lacks appropriate education and/or experience related to mining careers.

This report investigates the labour market pressures in Nunavut's mining industry and provides a forecast of its hiring requirements and available talent. MiHR's labour market forecasts for Nunavut show critical shortages in many mining occupational categories through to 2024. Forecasts for Nunavut predict hiring requirements of more than 1,120 workers by 2024, under a baseline scenario — a number that represents over two-thirds of the current workforce. This outlook report also provides a forecast of available talent, as well as analysis of the gaps in certain occupational categories. Projections indicate that for core mining occupations, the industry will attract roughly 120 workers over the next 10 years, to meet a requirement of almost 790 workers.

About the Report

The Mining Industry Human Resources Council (MiHR) has prepared this report in partnership with the Government of Nunavut and with support from the Canadian Northern Economic Development Agency (CanNor). The report provides MiHR's forecasts of hiring requirements and available talent for Nunavut's mining industry over a 10 year horizon. The projected gaps between hiring requirements and available talent for a select group of occupations relevant to Nunavut's mining industry are analyzed and recommendations to address the gaps are discussed.

- The hiring requirements forecasts are customized to incorporate Nunavut-specific factors (e.g., commodity mix) to predict change in employment and replacement requirements over a 10 year horizon, under three economic scenarios. In addition to an industry-wide outlook, forecasts are also broken down for three prominent mining sectors in Nunavut — extraction, mineral exploration and support services. Finally, forecasts are broken down for selected occupational categories relevant to the industry.

- The available talent forecasts project the industry's share of talent for each exploration and mining-related occupation over a 10 year horizon, accounting for mobility trends (e.g., interprovincial and international migration) and entries/exits into mining due to various other factors (e.g., school graduates transitioning to work, retirements and separations, etc.)
- A side-by-side comparison of hiring requirements and available talent for occupational groups reveals pressure points and trends. A discussion on strategies for addressing the shortage follows.

Industry Definition and Scope

MiHR defines the mining industry as including all phases of the mining cycle: prospecting and exploration; construction and development; extraction; processing and reclamation, closure, care and maintenance. Forecasts presented in this report rely on data collected and aggregated through Statistics Canada. Thus, Statistics Canada's North American Industry Classification Codes (NAICS) and National Occupational Classification (NOC) codes are used to define the mining industry in this report. Specifically, MiHR uses three NAICS categories (i.e., mining, mineral exploration and support services) and 42 NOC categories to define Nunavut's mining industry. A full description on the NAICS and NOC codes included in the forecasts are found in Appendix C.

Data Collection and Methodology

MiHR's forecasts rely on a variety of data inputs, mining industry intelligence and other information that is incorporated into models and assumptions that drive the analysis. For example, MiHR's hiring requirements forecasts use past trends and consensus forecasts in an econometric model to predict mining employment and replacement requirements over a 10 year horizon. Information and data on known advanced development and mine construction projects are considered and captured under these hiring requirements forecasts for Nunavut. The expected future developments are balanced against known economic activity and consensus forecasts of future conditions – including factors that can impact timelines for advanced development activities or force closures or production interruptions. More on MiHR's forecasting methodology can be found in Appendix A.



MiHR conducted targeted surveys and interviews to gather the important expertise of employers and stakeholders in Nunavut's mining, exploration and support service sectors. Findings from this on-the-ground research were used to inform aspects of the modeling exercise and validate data from other sources, such as the occupational structure of the workforce, demographic characteristics, participation and turnover. In January 2014, MiHR also hosted a mining stakeholder forum to obtain valuable feedback and strengthen the forecast interpretations and recommendations included in this report.

Other industry intelligence is captured from key data sources from Statistics Canada (e.g., the *National Household Survey/Census*, *Labour Force Survey*, *Survey of Employment Payroll and Hours*, *Canada Business Patterns*) to other information sources such as Natural Resources Canada, the Nunavut Bureau of Statistics, the Northwest Territories & Nunavut Chamber of Mines and Nunavut Mining, Mineral Exploration & Geoscience Overviews. These sources cover a wide range of important themes including: labour market statistics and reporting (e.g. labour force participation, separation, demographics); notable economic trends and current and upcoming mining projects in the region.

Report Overview

This report is divided into six main sections. Section One provides a brief introduction and definition of industry scope and sets the foundation for Section Two, that presents an economic overview of Nunavut's mining industry and highlights the important economic variables that are considered in this report. Next, Section Three summarizes the demographic trends in Nunavut's mining labour market and Section Four goes into more detail to provide forecasts of hiring requirements for Nunavut's mining industry, broken down by industry sector and key mining occupations. Section Five presents a forecast of available talent by occupational group, and finally, Section Six includes a high-level gap analysis based on comparison of the forecasts presented for hiring requirements and available talent. The report concludes with discussion on potential strategies to address the identified labour gaps and ensure the future competitiveness of the industry.



2. Economic Overview

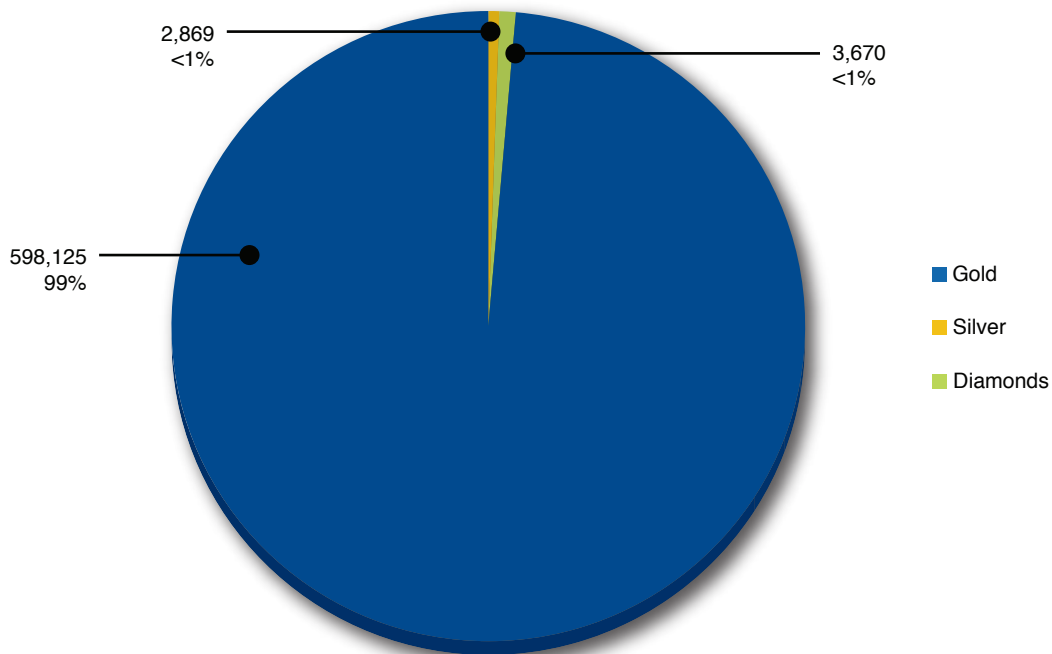
2. Economic Overview

Nunavut's mining industry has experienced significant development in recent years, leading to one operating mine (in production since 2010), one mine in advanced construction nearing full production, as well as numerous advanced development projects and mineral exploration activities. This activity has positioned mining as a major contributor to Nunavut's economy. Mining accounted for nearly 15 per cent of Nunavut's total Gross Domestic Product (GDP) in 2013 – four years earlier, this share was about 0.5 per cent.¹ As a result of this dramatic increase in activity, it is anticipated the industry will continue to deliver an abundance of opportunity to Nunavut in the coming years, yet labour pressures and skills shortages may limit the industry's ability to realize this potential.

As shown in Figure 1, Nunavut produced three types of minerals in 2012 – gold, silver and diamonds. Gold represented most of Nunavut's mineral production value, followed by diamonds and silver. This outcome is expected given that Nunavut's operating mine is a producer of gold. According to Natural Resources Canada's (NRCan) statistics on mineral production, Nunavut is the third largest producer of gold in Canada with approximately 11 per cent (or \$600 million) of the country's overall production value in 2012.

Note that when mineral exploration is taken into account, Nunavut's mining industry involves a broader portfolio of mineral resources, including iron, uranium and base metals. Current advanced development projects will reshape the production outlook as Nunavut's mining industry continues to evolve.

Figure 1 – The Value of Mineral Production, by Commodity, in Nunavut's Mining Industry, 2012 (CDN, thousands)



Source: Natural Resources Canada; Mining Industry Human Resources Council, 2014

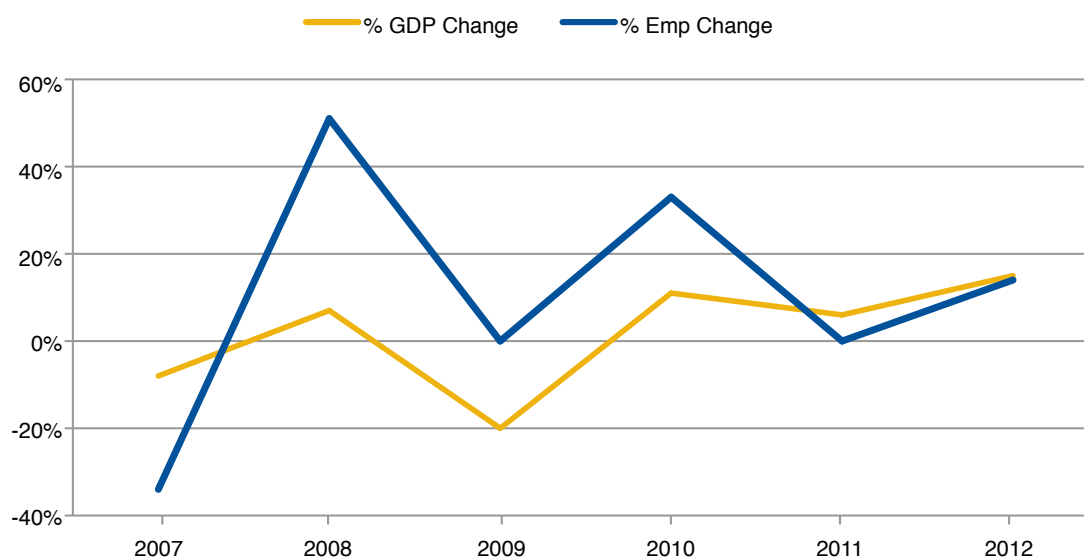
¹ The Conference Board of Canada, *Territorial Outlook – Economic Forecast*, 2013.

Gross Domestic Product Growth

Gross Domestic Product (GDP) provides a measure of economic output for an industry and a region. Research by MiHR has found that, across Canada, there is a strong correlation between GDP movement and employment.² Additionally, fluctuations in mining's GDP growth and employment growth are characteristically volatile. The forecasts presented in this report account for natural volatility of the mining industry.

Figure 2 illustrates the link between GDP growth and employment growth in Nunavut's mining industry from 2007 to 2012. Taking into account the up-and-down pattern observed in recent years, Nunavut's annual mining GDP is projected to slightly decrease over the long-term to 2024.

Figure 2 – Gross Domestic Product (GDP) and Employment in Nunavut's Mining Industry



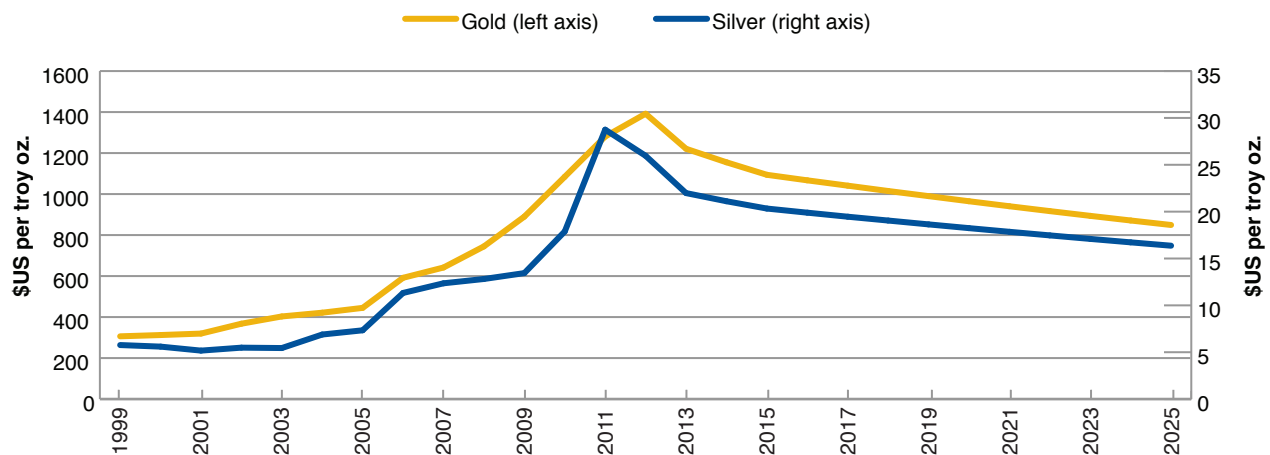
Source: Mining Industry Human Resources Council, 2014

Mineral Prices Outlook

The historical and forecasted price movements for gold and silver are illustrated in Figure 3. In recent years, increased demand from emerging global economies has elevated commodity prices. Still, sluggish global economic growth, in addition to financial market uncertainty is reflected in weaker commodity prices since 2012. According to World Bank commodity forecasts for gold and silver, a modest downward trend is expected to continue over the forecast horizon, although mineral prices are expected to stay high by historical standards. This commodity outlook has been updated from previous forecasts that predict a period of downward price adjustment with a modest steady increase thereafter. The recent adjustments to this outlook highlight the uncertainty in the outer limits of the forecast horizon. MiHR's expectation of commodity prices is aligned with the World Bank forecasts, which tend to be conservative estimates.

² Mining Industry Human Resources Council (MiHR), *Canadian Mining Industry Employment, Hiring Requirements and Available Talent 10-year Outlook*, 2013.

Figure 3 – Historical and Forecasted Price of Gold and Silver



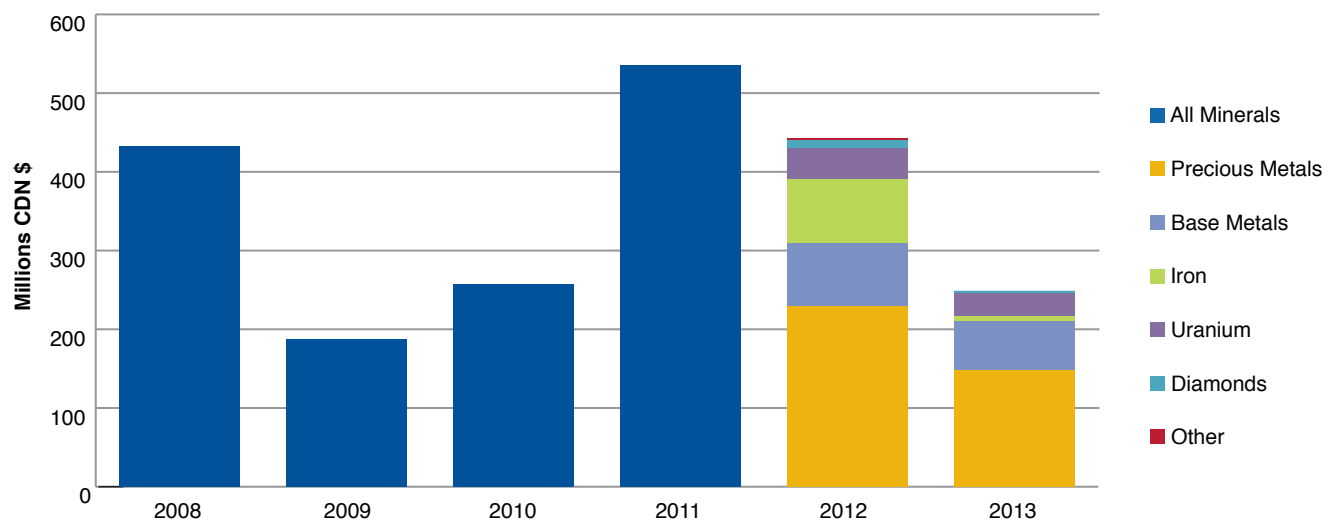
Source: World Bank; Development Prospects Group, 2014

MiHR has found a positive correlation between commodity price movements and employment in the exploration and mining industry and these global trends are important indicators of future employment trends in Nunavut. Hiring requirements forecasts rely in part on leading forecasts of commodity prices, which are used to form a prediction of the industry’s optimal employment level over time.

Exploration Activity

Nunavut is host to a relatively large volume of mineral exploration activity. According to NRCan’s estimation of exploration and deposit appraisal expenditures, the territory is reported to account for 11 per cent of Canada’s overall exploration spending in 2012 – the fourth largest in the country. Additionally, Nunavut’s exploration sector searches for a number of minerals extending beyond the minerals currently produced (i.e., mainly gold in 2012). Figure 4 shows exploration and deposit appraisal expenditures from 2008 to 2013. Note the last two years in the graph provide a breakdown by the commodity type (these data were not available for the other years).

Figure 4 – Value of Mineral Exploration and Deposit Appraisal Activity in Nunavut, 2008 to 2013



Source: Natural Resources Canada; Mining Industry Human Resources Council, 2013

Exploration spending has rebounded following a global drop in 2009; however, recent instability in the global economy and caution from the investment community has created challenges across Canada for many junior companies looking to fund their exploration activities. Nunavut's exploration activities have slowed as a result, even as demand from emerging countries is anticipated to be strong. Thus, growth in Nunavut's exploration sector may slow to a period of rest until stability has returned to mineral prices and the global economy in general.

Nunavut's mining industry has established momentum over the past few years, following the opening of the Meadowbank gold mine in 2010. While there is a positive outlook for the industry to continue to have new development opportunities, many of the current underlying economic factors point to a cautious environment that could lead to investment, price and spending decreases. That said, Nunavut has a healthy, untapped pipeline of projects that can change this outlook as additional mines come online. The forecasts presented here account for these factors and, despite the cooling trends, labour market pressures are prevalent in the analyses.



3. Mining Labour Market Trends

3. Mining Labour Market Trends

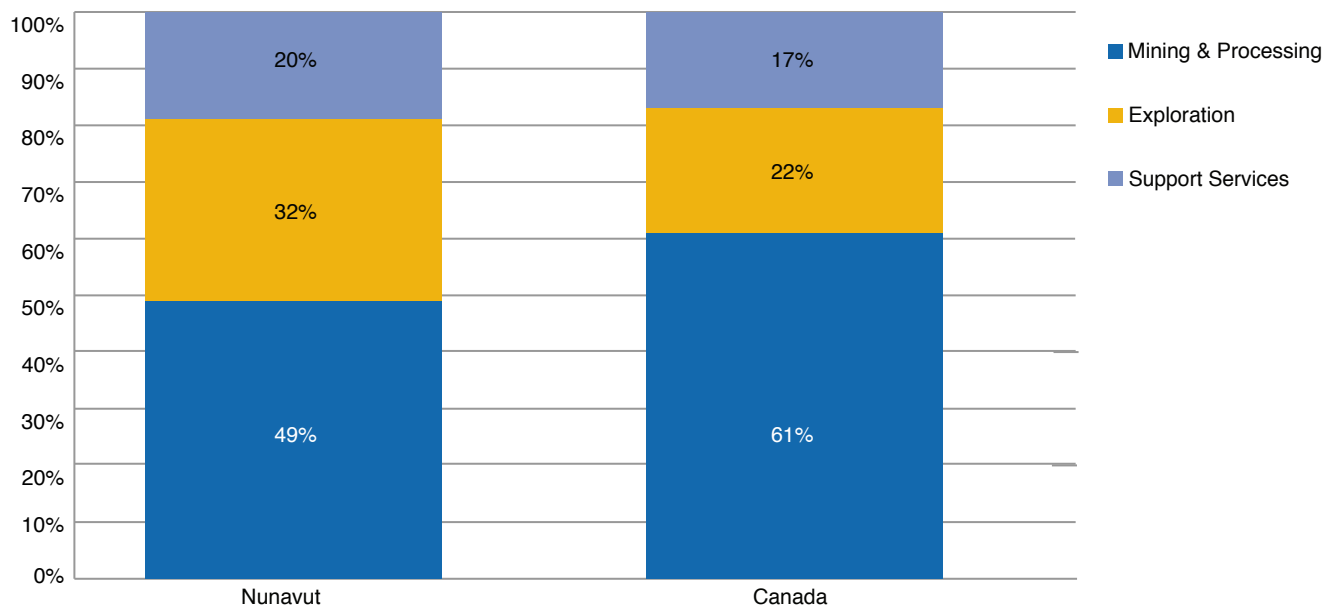
The strength of Nunavut’s mining industry will depend on the workers that make new development opportunities a reality. Just as Nunavut’s mining industry has re-emerged in recent years, so too has its labour force. This section examines trends in Nunavut’s mining labour force – including its size and demographic profile – to understand the potential pressures they will have in the labour market. Currently, Nunavut’s labour force is relatively young compared to Canada’s mining labour force; it employs a large proportion of Inuit and supports a large number of commuting workers (i.e. those working in the territory but living elsewhere). These factors combine to form certain demographic challenges that could impact the preparedness of Nunavut’s mining industry for future activities.

Mining Activities by Sector

Labour market characteristics can vary between sectors. For instance, the mineral exploration workforce tends to be highly mobile and comprised of skilled and professional workers who require high levels of education and often delay retirement. Sector-specific factors such as these can influence the prevailing labour market pressures felt by the industry.

MiHR estimates employment in Nunavut’s mineral extraction sector at 1,075 workers and over 1,140 workers in exploration and mining support services. The significant advanced development project undertaken in recent years is counted in the mining sector baseline employment in 2013 and as such there is no boost in employment expected over the forecast horizon due to this activity. Figure 5 displays the relative size of different mining sectors in Nunavut and Canada. Mineral exploration is shown to be more prominent in Nunavut – this is not surprising given that mining development is relatively recent. Canada’s mining industry, on the other hand, is mature by comparison and employs more people in extraction activities.

Figure 5 – Employment in Mining Sectors in 2013, Nunavut and Canada



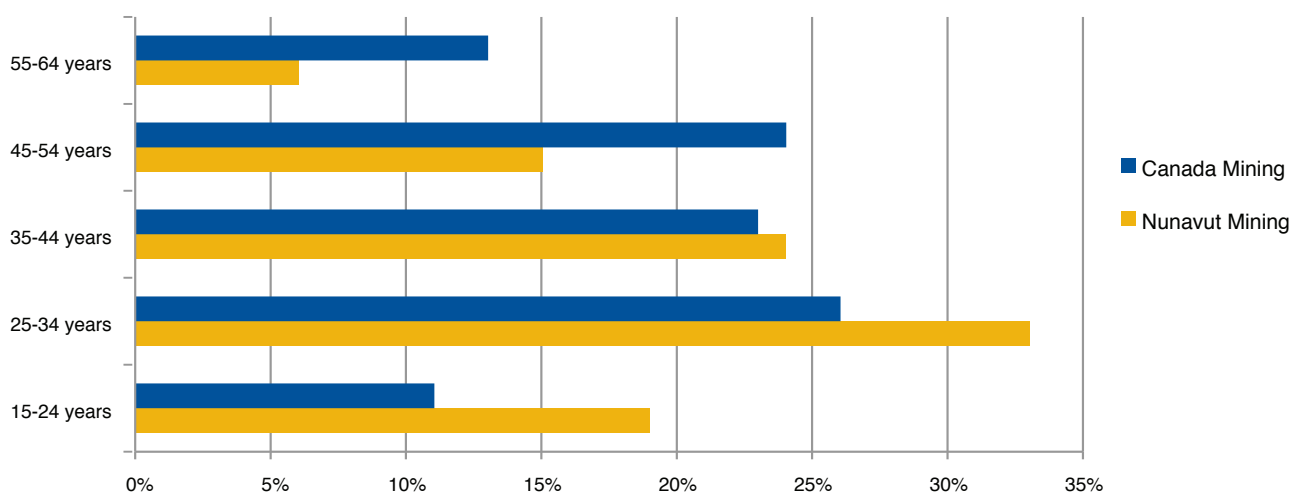
Source: Mining Industry Human Resources Council, 2014

Age Profile

Previous research by MiHR has shown that Canada’s mining labour force is relatively older than those of other industries.³ This trend is expected to add to the pressures of replacing experienced older workers who are near retirement. The pressure is further amplified given that Canada’s mining industry has historically attracted fewer younger people than other industries.

As Figure 6 illustrates, Nunavut’s mining labour force exhibits the opposite pattern: a much higher proportion of the labour force is younger (i.e. 15 to 34 years of age) while a lower proportion is older. Nunavut’s overall population is also very young; according to Statistics Canada, the median age is the lowest in the country in 2013 at 25 years (Canada’s median age is 40 years). These age demographics mean that the impact of retirement is not expected to play a role in labour market pressures in Nunavut. The territory’s emerging younger population is a potential advantage that, with opportunities for training/education and industry experience, could offset the need to find skilled workers.

Figure 6 – Age Profile of the Mining Labour Force, Canada and Nunavut, 2011



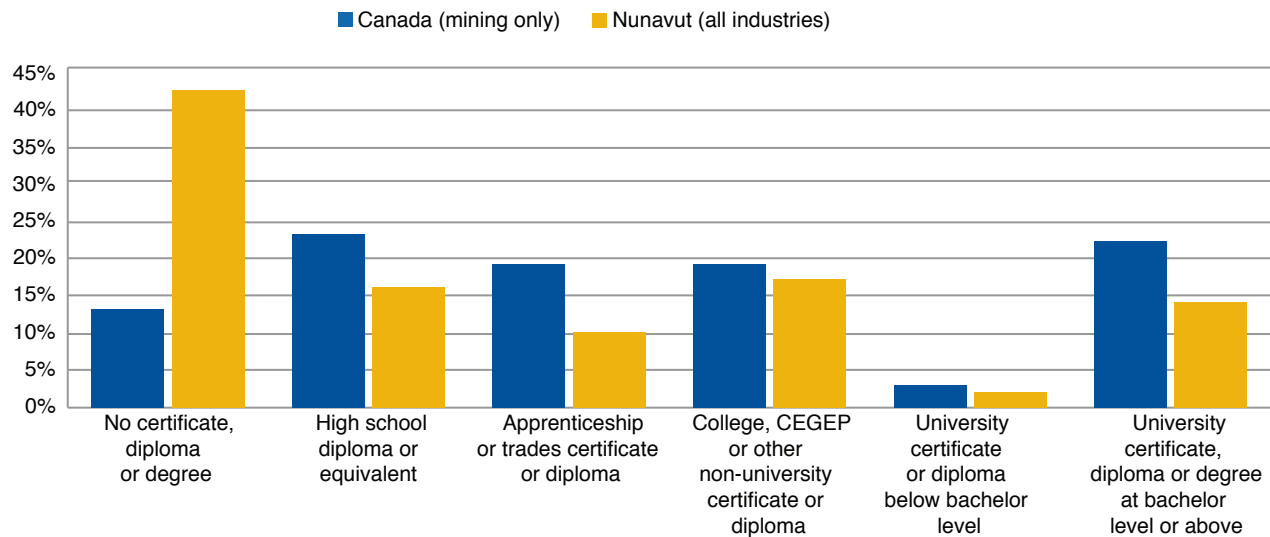
Source: Mining Industry Human Resources Council, 2014

Education Profile

Figure 7 shows the educational attainment in Canada’s mining labour force and in Nunavut’s overall labour force. The profile reveals gaps in key educational categories for Nunavut – in particular, there are fewer persons with a high school diploma, an apprenticeship/trade certificate, and/or a university degree compared to Canada’s mining labour force. Additionally, a higher portion of Nunavut’s labour force is without a certificate, diploma or degree. In view of this trend, non-residents are often called upon to meet the need for workers with technical or professional training and industry experience. The gaps in educational attainment and industry requirements present a significant challenge to mining stakeholders in Nunavut, and result in a large commuter workforce. But these gaps are also an opportunity for the territory’s local labour force, to the extent that the mining industry will continue to demand highly trained and skilled workers and education and training partnerships could help prepare the local labour force to fill these roles.

³ Mining Industry Human Resources Council (MiHR), *Canadian Mining Industry Employment, Hiring Requirements and Available Talent 10-year Outlook*, 2013.

Figure 7 – Educational Attainment in Nunavut’s Labour Force and Canada’s Mining Labour Force, 2011

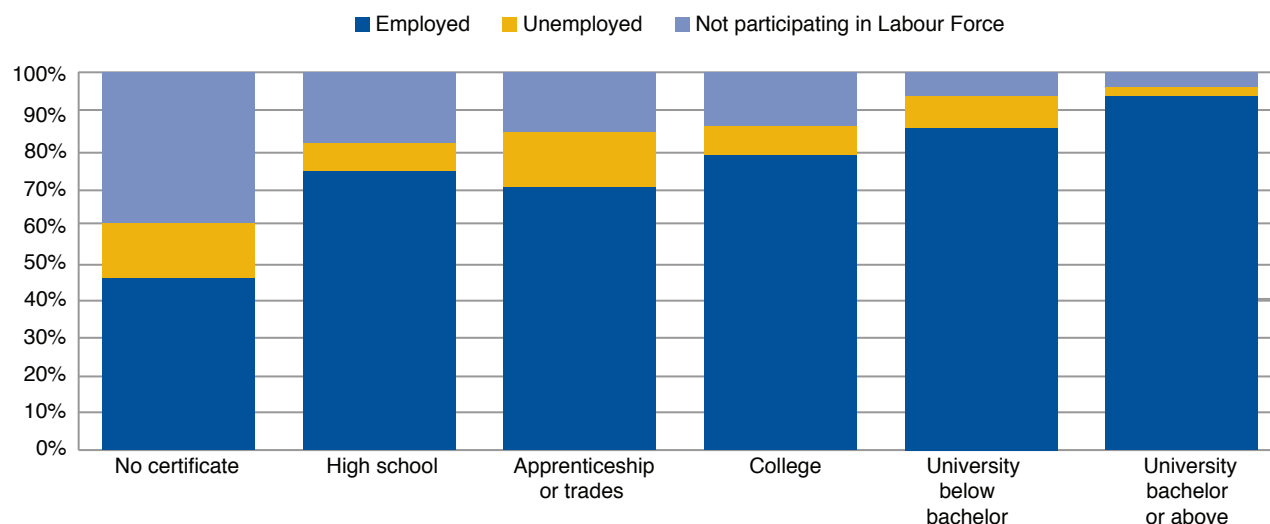


Source: Mining Industry Human Resources Council; Statistics Canada, 2014

Educational Attainment has a profound impact on employment and labour force participation in Nunavut. As Figure 8a demonstrates, those without a certificate, diploma or degree are less likely to participate in the labour force, and those that do participate are by far less likely to be employed. This trend is also generally true across the country, as shown in Figure 8b.

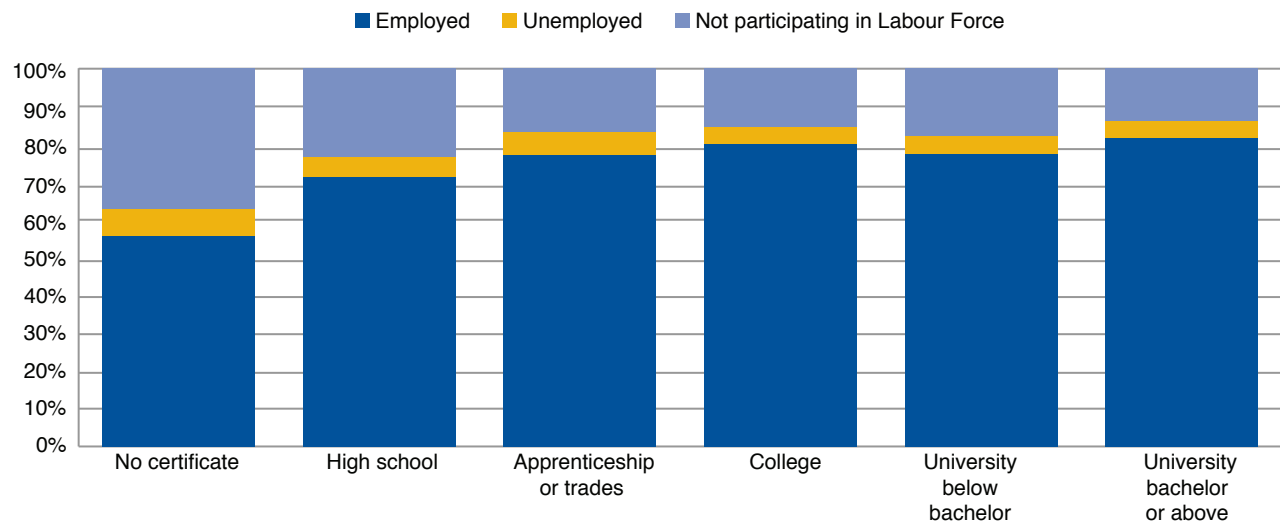
In contrast, those in Nunavut with advanced education levels (i.e., University and College) realize much higher participation and employment rates than their counterparts in the rest of Canada. This would further suggest that opportunities are flowing to the higher education categories and that the return on those education levels is remarkably large in Nunavut. Note that this only refers to employment outcomes within each educational category and does not inform on the relative size of each category.

Figure 8a – Employment, Unemployment and Participation in Nunavut, by Educational Attainment, 25 to 64 year olds, 2011



Source: Mining Industry Human Resources Council; Statistics Canada, 2014

Figure 8b – Employment, Unemployment and Participation in Canada, by Educational Attainment, 25 to 64 year olds, 2011



Source: Mining Industry Human Resources Council; Statistics Canada, 2014

Commuter Workforce

Nunavut has a high percentage of employees who work in the territory but live in another province or territory. MiHR’s survey of mining employers finds that the territory draws roughly three quarters of its workforce from various (and often distant parts) of the country. This characteristic is inherent to the mining industry in other parts of Canada. For example, much of the exploration workforce is shared with other jurisdictions. Geoscientists, in particular, are more inclined to follow the geology in their activities as opposed to the political boundaries around that geology.



There is strong emphasis in Nunavut to first hire from the local labour force. Mining companies in the territories have various partnership agreements (e.g. Impact and Benefits Agreements; Socio-economic Agreements) in place with local communities that set out terms and conditions resulting from the creation of the mine. These often include employment targets negotiated between the mining company and the community. The development of Inuit Impact & Benefit Agreements (IIBA) by Inuit organizations and mining companies ensures the participation and sets goals for Nunavut Land Claims Agreement (NLCA) beneficiaries employed for each project.

Nevertheless, due to a number of challenging factors, employers have had to adopt fly-in-fly-out strategies from other jurisdictions to supplement their workforce needs. The remoteness of mining operations, a small population size, a lack of roads and infrastructure and housing, and education concerns all restrict access to the local talent pool. Employers in the region are likely to continue to use this approach to the extent that northern mining communities continue to face these barriers. The lack of local mining towns or developed centres near the mine operations lowers the incentive of commuters to relocate to Nunavut.

Relying on a large base of non-resident workers can also create hiring pressures as employers compete for commuting workers with other mining centres across the country. As the needs and labour demands shift in the rest of the Canadian mining industry, workers commuting long distances will have attractive options to work closer to their permanent residence. Respondents to MiHR's survey of employers cited lack of family in Nunavut and commuting distance as reasons for turnover in their operations.



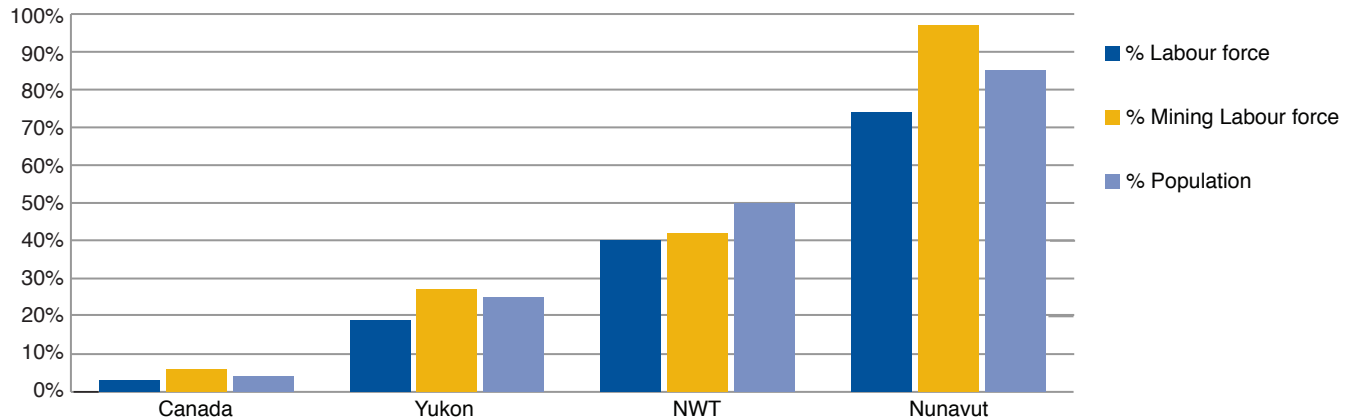
Aboriginal Peoples

The future strength of Nunavut's mining labour force will depend greatly on the participation of Inuit. This group represents a higher share of the mining labour force compared to other sectors, including other resource sectors. The significance of Inuit participation is emphasized in Nunavut where Inuit make up the majority of the region's growing population. The Nunavut Bureau of Statistics estimates that 78 per cent of Nunavut's working aged population (15 years and older) is Inuit.

Figure 9 demonstrates that, across Canada and in Nunavut, participation among Aboriginal peoples in mining surpasses that of other industries. Aboriginal peoples represent about 3 per cent of the overall labour force, and they make up about 5 per cent of the mining labour force.⁴ Almost 97 per cent of the resident workforce in Nunavut are Inuit. This mainly stems from Nunavut's relatively large Inuit population; however, as Figure 9 illustrates, there is strong Inuit participation in mining overall. There are further opportunities to train and develop this workforce to the extent that many are currently employed in entry-level positions, and given that the industry relies on the commuter workforce for a number of skilled workers.

⁴ Mining Industry Human Resources Council, *Canadian Mining Industry Employment, Hiring Requirements and Available Talent 10-year Outlook*, 2013.

Figure 9 – Aboriginal Participation in Mining, Canada and Northern Territories, Local Labour Forces, 2011



Source: Mining Industry Human Resources Council, 2014

Aboriginal peoples are often employed in entry-level and labourer roles in the mining industry. MiHR has identified potential barriers that can restrict their entry into certain mining occupations. These include:⁵

- Employer and potential employee perceptions that educational and skills levels do not meet entry requirements;
- Limited employer awareness of how to find and recruit candidates and how to incorporate cultural norms into their hiring processes; and
- Improvements to HR aspects of various partnership agreements between mining companies and Aboriginal communities.

Diversity in Nunavut’s Mining Industry

Diverse groups, such as women and immigrants, offer the mining industry an enormous untapped source of skilled workers. Women comprise about 48 per cent of the overall labour force — but only 17 per cent of the mining labour force. This trend is similar in Nunavut where women represent about 20 per cent of the mining labour force.

Immigrants are also an underrepresented group in Canada’s mining industry. This is especially the case in remote regions of the country as immigrants tend to move to and settle in urban centres with established immigrant populations. Immigrants account for 21 per cent of Canada’s overall labour force, but only 13 per cent of the mining labour force. In Nunavut, there is not a large base of immigrants. As a result, they are nearly absent in Nunavut’s mining labour force.

⁵ Mining Industry Human Resources Council, *Take Action for Diversity*, 2011 and *Lessons Learned: A Report on HR Components of Aboriginal Community and Mining Company Partnership Agreements*, 2012.



4. Hiring Requirements

4. Hiring Requirements

MiHR's forecasts of hiring requirements estimate the cumulative number of workers that the industry will need to hire over the next decade. The estimates are greatly impacted by prevailing economic and demographic trends and activities, as discussed in previous sections of this report.

A relatively high share of the hiring pressure is anticipated to come from replacing exiting workers; the bulk of which are non-retirees. Thus, the impact of a decidedly mobile workforce is revealed in Nunavut's hiring requirements forecast. Economic indicators such as price movements are also reflected in Nunavut's hiring requirements forecast. Overall, Nunavut's hiring requirements are estimated at 1,120 hires by 2024, under a baseline scenario. Note that the mining workforce at the start of the forecast is estimated to be 2,215 workers under MiHR's definition of the mining industry (see Appendix C for more details).

The hiring requirements forecasts presented are also broken down by occupation and by industry sector. The occupational forecast finds that *trades and production occupations* are among the highest in demand. The industry sector forecast finds that *mineral extraction* will have the largest share of hiring requirements, followed by *mineral exploration* and *mining support services*.



Description of the Model

MiHR uses an economic model to forecast employment and hiring requirements over a 10 year horizon. The model accounts for the factors affecting the size and composition of the workforce and uses a combination of independent economic forecasts, Statistics Canada data and information collected directly from industry stakeholders. Details on the hiring requirements model and the methodology used to develop forecasts can be found in Appendix A.

Hiring requirements have two distinct components – ‘Net Change in Employment’ and ‘Replacement Requirements.’ The following section describes these components in more detail.

Net Change in Employment

MiHR's employment model predicts changes in employment through factors that are tied to levels of economic activity. Net change in employment describes the industry's adjustment to new mining developments (i.e. openings/closures) as well as cycles of economic activity. Previous research by MiHR has demonstrated that fluctuations in employment have a strong correlation with movements in mining GDP.

Note that the forecast tables that follow do not show new job growth, but rather represent a net estimate of employment change over the entire forecast period. Net change in employment equally reflects new and increased mining activity with negative workforce adjustments due to mine closures and slowdowns in production. For example, a new mine may open leading to 500 new jobs being created; however, along with this expansion activity, exploration activity elsewhere may have concerns about their business environment and reduce the workforce by 250 workers – this combined activity would result in a net change in employment of 250 workers. Note that the above example is a hypothetical scenario and is unrelated to the forecasts provided below.



GDP and Employment Forecasts

MiHR builds a forecast of GDP using region-specific commodity prices and other key economic drivers. Intelligence on historical and current price movements, labour productivity, upcoming mining projects and other important indicators of economic trends are also taken into consideration. According to MiHR's projections, real GDP in Nunavut's mining industry is expected to undergo a slight decline that will correspond with mining industry employment to 2024. In the forecasts presented here, employment for a particular mine site that is ramping up to full production in the first year of the forecast is counted in the start-year of the employment forecasts.

Replacement Requirements

Replacement requirements describe the need to replace workers due to retirement and non-retirement separation from Nunavut's mining industry. Together, these factors contribute to the number of exits from the workforce that are not a direct consequence of changing economic conditions, but rather result from the natural behaviour of labour force participants.

The industry's need to replace exiting workers will fluctuate depending on the prevailing economic conditions. MiHR assumes that not every exit will turn into a hiring replacement. The likelihood that a workforce exit is replaced/rehired by the industry is adjusted for three scenarios in this analysis. Under an expansionary scenario, MiHR assumes that 100 per cent of exits will be replaced; this replacement rate is assumed to be marginally less under the baseline scenario and further reduced under a contractionary scenario.

Retirement

MiHR uses demographic information (i.e., age and educational background) to predict the retirement behaviour of Nunavut's mining labour force over the forecast period. A brief description of this is found in Appendix B. At the national level, retirement makes up the largest segment of forecasted hiring requirements. Given that Nunavut's mining labour force is relatively younger, retirement is not anticipated to have the same impact on hiring needs compared to other mining regions in Canada. Nunavut's estimated retirement is therefore relatively modest for all years of the forecast; however, the retirement rate for all mining sectors is projected to slightly increase over the forecast horizon. The inclusion of the commuter workforce into this estimate increases the projected rate of retirement.

Non-Retirement Separation

The non-retirement separation rate used in MiHR's forecasts captures all other separation behaviour that is not related to retirement. MiHR has estimated the non-retirement separation rate to be roughly 4 per cent for Nunavut's mining industry. For the purposes of this study, estimates were created for the full mining labour force including non-residents and then validated against other research inputs. Previous MiHR research found that the national non-retirement separation rate in the mining industry is about 2 per cent; however, this rate will be higher for any given region of the country, due to interprovincial migration. In Nunavut, the large segment of non-resident labour and high degree of labour mobility presents challenges in creating estimates of non-retirement separation rates.

Survey responses from industry employers in Nunavut indicated that average turnover rates were approximately 15 per cent in 2012; however, workers leaving a particular mining company may remain in Nunavut's mining industry. Thus, 15 per cent represents the upper-limit of the territorial non-retirement separation rate. Given these limits, MiHR has estimated the non-retirement separation rate for the mining workforce in Nunavut to be 4 per cent – a conservative figure that is between the employer-reported rate and the national industry separation rate.

Hiring Requirements Forecasts

The scenarios presented in this report are based on the “total workforce” to capture the industry's overall needs in the next decade. This includes both the workforce that is living in Nunavut and a sizable commuter workforce living outside of the territory. By including the commuting segment of the workforce, the forecasts below present a complete picture of the industry's employment needs and ultimately its leading labour market pressures.

As the employment estimates based on Statistics Canada data alone refer to Nunavut residents and not the total mining workforce, MiHR includes other data sources and indicators in its estimates of employment in order to reflect the total mining workforce. Estimating the total workforce is especially challenging in exploration and support services due to the extremely mobile nature. For these sectors, a number of metrics (i.e., exploration spending, number and type of projects, organizational sizes and comparison with data in other regions) and consultation with key informants were used to shape an estimate of total employment.

MiHR's hiring requirements forecasts are built on three scenarios – baseline, contractionary and expansionary. Under the baseline scenario, Nunavut-specific commodity prices, mining GDP and labour productivity are aligned to various leading economic forecasts and industry intelligence on mine construction and advanced development activities to arrive at an expected projection of employment. Under the baseline scenario, steady growth is expected in the industry. The expansionary scenario assumes greater-than-expected growth, while the contractionary scenario assumes lower-than-expected growth. Both expansionary and contractionary scenarios take into account historical economic trends, consensus forecasts of future trends and are further supported by intelligence of Nunavut's mining industry.

Cumulative Hiring Requirements

The 10-year cumulative hiring requirements shown in Table 1 are projected to be 1,120 workers under a baseline scenario; 1,820 workers in an expansionary scenario; and a loss of 50 workers in a contractionary scenario. MiHR estimates that Nunavut's mining industry employed roughly 2,215 people in 2013.

Table 1 – Cumulative Hiring Requirements Forecasts, by Scenario – to 2024

	Net Change in Employment	Replacement Requirements		Cumulative Hiring Requirements 2015
		Retirement	Non-Retirement	
Contractionary	-380	240	90	-50
Baseline	30	400	690	1,120
Expansionary	180	570	1,080	1,820

Source: Mining Industry Human Resources Council, 2014

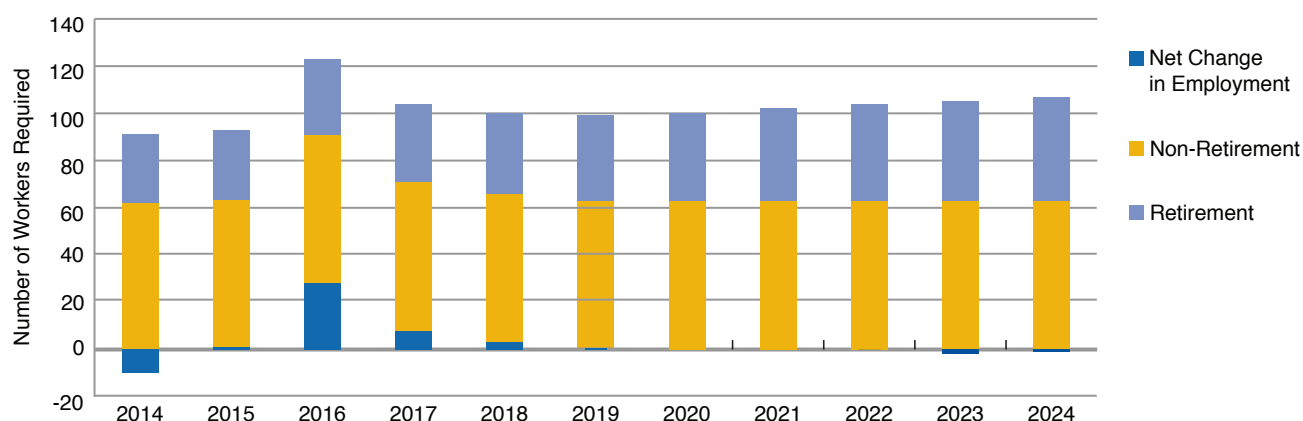
*Note that numbers may not add perfectly due to rounding. Also note that hiring requirements do not translate to new job growth; they reflect the combination of net change in employment and replacements.

Figure 10 provides a year-by-year breakdown of the hiring requirements under a baseline scenario. On an annual basis, hiring requirements average about 100 workers per year; non-retirement exits/industry churn account for the largest source of hiring pressures over the forecast.

The relatively small scale of Nunavut’s mining industry at the beginning of the forecast makes the estimated outcomes more sensitive to new emerging projects – that is, a single new mining project can have a substantial impact on Nunavut’s overall industry compared to a similar project in another jurisdiction that has an established base of activity. Therefore, Nunavut’s forecast has been adjusted to incorporate known project activities that will have a large impact on employment in Nunavut’s mining industry.

It is important to note that, due to the small-scale nature, one advanced development project has shifted the landscape of Nunavut’s mining industry in recent years. The majority of the new hiring stemming from this project has already occurred before the start of the forecasting period (2014 to 2024). For the purpose of this forecast, MiHR has counted this project in the mining sector employment in 2013. As a result, the project’s recent hiring impact is not reflected in the forecast that begins in 2014.

Figure 10 – Annual Hiring Requirements Forecast, Baseline Scenario – 2014 to 2024



Source: Mining Industry Human Resources Council, 2014

* Captures the collective activity for mining, mining support services and exploration.

Table 2 shows positive cumulative hiring requirements over two-, five- and 10-year horizon for each scenario.

Table 2 – Cumulative Hiring Requirements Forecasts, by Scenario – 2016, 2019, 2024

	Cumulative Hiring Requirements		
	2016	2019	2024
Contractionary	-140	-100	-50
Baseline	300	600	1,120
Expansionary	580	1,040	1,820

Source: Mining Industry Human Resources Council, 2014

Hiring Requirements Forecasts by Occupational Category

Table 3 provides the cumulative hiring requirements for broad occupational groups, under a baseline scenario. The categories shown in Table 3 consist of key occupations identified by MiHR to be core to the mining industry. These occupations are defined by the National Occupational Classification (NOC) categories. See Appendix C for a complete list. The table shows the greatest number of hiring requirements will be in *Trades and Production Occupations*. Of course high demand in terms of numbers does not necessarily translate to high concern or difficulty to find. For example, the need to hire over 100 professional and physical science workers may be more of a challenge or require longer term planning than other categories, given the education and job experience requirements needed to replace retiring workers in this category.



Table 3 – Cumulative Hiring Requirements Forecast, by Broad Occupational Categories, Baseline Scenario – 2016, 2019, 2024

	Cumulative Hiring Requirements		
	2016	2019	2024
Trades and Production Occupations	130	280	505
Professional and Physical Sciences Occupations	15	30	60
Human Resources and Financial Occupations	<5	<5	5
Support Workers	20	40	80
Technical Occupations	10	20	60
Supervisors, Coordinators, and Foremen	20	35	80
All Other Occupations	105	195	330
Total	300	600	1,120

Source: Mining Industry Human Resources Council, 2014

For each broad occupational category reported above, Table 4 illustrates the five occupations with the highest forecasted needs. The numbers shown are for the baseline scenario.

Notable occupations with the highest projected hiring requirement include:

- Heavy equipment operators (except crane)
- Heavy-duty equipment mechanics
- Truck drivers
- Drillers and blasters - Surface mining, quarrying and construction
- Geological and mineral technologists and technicians
- Supervisors, mining and quarrying
- Cooks
- Transportation route and crew schedulers
- Inspectors in public and environmental health and occupational health and safety

Table 4 – Cumulative Hiring Requirements Forecast, Top Five per Broad Occupational Category, Baseline Scenario – 2016, 2019, 2024

	Cumulative Hiring Requirements		
	2016	2019	2024
TRADES AND PRODUCTION OCCUPATIONS			
Heavy equipment operators (except crane)	50	105	195
Heavy-duty equipment mechanics	20	40	70
Truck drivers	15	35	60
Other trades helpers and labourers	10	20	35
Drillers and blasters - Surface mining, quarrying and construction	10	20	35
PROFESSIONAL AND PHYSICAL SCIENCE OCCUPATIONS			
Geologists, geochemists and geophysicists	5	10	20
Mining engineers	5	5	15
Other professional occupations in physical sciences	5	5	10
Chemists	< 5	5	5
Other professional engineers, n.e.c.	< 5	5	5
HUMAN RESOURCES AND FINANCIAL OCCUPATIONS			
Specialists in human resources	< 5	< 5	5
Human resources managers	< 5	< 5	< 5
Financial auditors and accountants	< 5	< 5	< 5
Financial and investment analysts	< 5	< 5	< 5
Financial managers	< 5	< 5	< 5
SUPPORT WORKERS			
Cooks	5	10	20
Transportation route and crew schedulers	5	10	20
Inspectors in public and environmental health and occupational health and safety	5	10	20
Administrative clerks	5	10	15
Dispatchers and radio operators	< 5	< 5	5

	Cumulative Hiring Requirements		
	2016	2019	2024
TECHNICAL OCCUPATIONS			
Geological and mineral technologists and technicians	5	10	25
Mechanical engineering technologists and technicians	5	10	20
Land surveyors	< 5	< 5	5
Chemical technologists and technicians	< 5	< 5	5
Land survey technologists and technicians	< 5	< 5	5
SUPERVISORS, COORDINATORS, AND FOREMEN			
Supervisors, mining and quarrying	10	20	40
Contractors and supervisors, mechanic trades	5	10	20
Supervisors, mineral and metal processing	5	5	10
Construction managers	< 5	< 5	5
Engineering managers	< 5	< 5	5

Source: Mining Industry Human Resources Council, 2014

Hiring Requirements Forecasts by Industry Sector

Hiring requirements forecasts are also broken down for three industry sectors: mineral extraction, mineral exploration and mining support services. These forecasts illustrate each sector's unique labour market characteristics as well as their separate responses to economic conditions.

Table 5 presents cumulative hiring requirements for each sector under a baseline scenario. All sectors represent a significant segment of the industry's overall employment. Among the sectors, mining is predicted to have the largest hiring requirements while mineral exploration is expected to have modest hiring needs as the global economic climate continues to dampen the sector's growth and the net change in employment estimate. The side-by-side sector forecasts indicate that non-retirement exits are a significant contributor of hiring pressures in all sectors.



Table 5 – Cumulative Hiring Requirements Forecast, by Industry Sector, Baseline Scenario – to 2024

	Employment in 2013	Net Change in Employment	Replacement Requirements		Cumulative Hiring Requirements 2015
			Retirement	Non-Retirement	
Mining	1,075	110	220	350	680
Mining Support Services	440	30	70	140	240
Mineral Exploration	700	-110	100	200	180
Total Mining (All three Sub-Sectors)	2,215	30	400	690	1,120

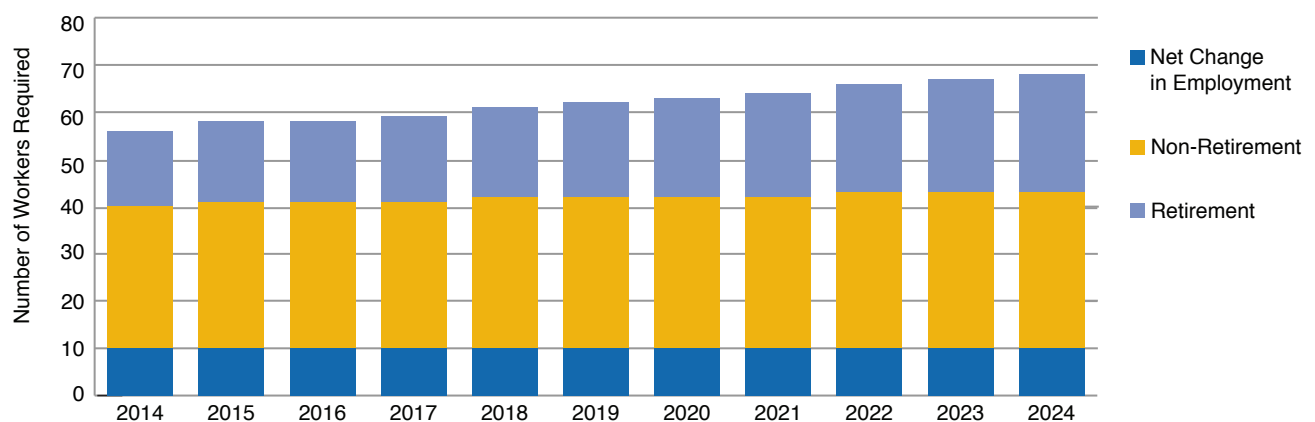
Source: Mining Industry Human Resources Council, 2014

*Note that numbers may not add perfectly due to rounding. Also note that the Statistics Canada industry sector definitions and classification schemes constrain some of the data analysis; “exploration” and “support services” may include or exclude activities that the sector would categorize differently—for example, drilling services are counted under “support services” and assay laboratories are counted under “exploration.”

Mining Sector Hiring Requirements

Figure 11 illustrates the year-by-year hiring requirements forecast for the mining sector under a baseline scenario. The extraction sector is projected to have positive hiring requirements over the next 10 years. The forecast exhibits steady production capacity over the longer-term. Replacement requirements are relatively stable with the largest segment of hiring requirements stemming from the need to replace workers in the non-retirement separation category.

Figure 11 – Annual Hiring Requirements Forecast, Mining, Baseline Scenario – 2014 to 2024

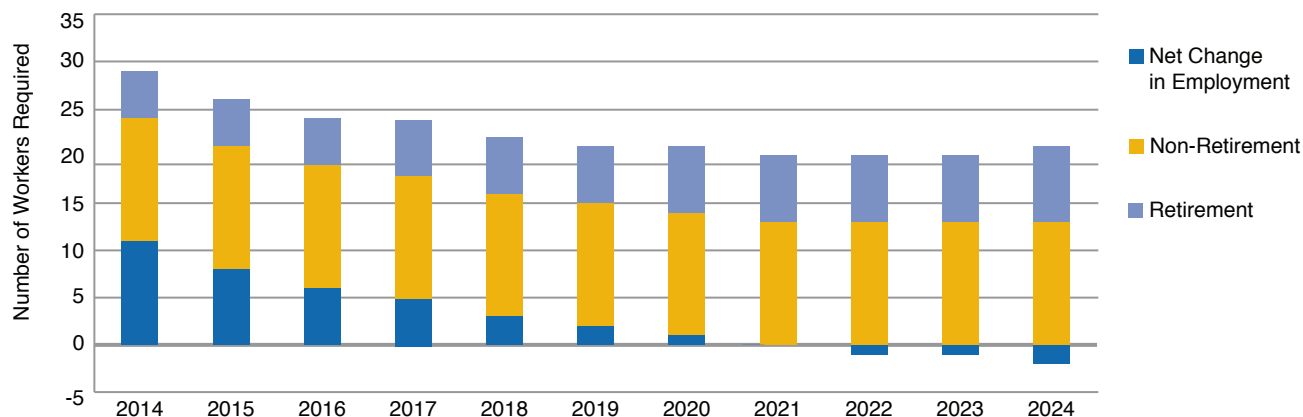


Source: Mining Industry Human Resources Council, 2014

Mining Support Services Sector Hiring Requirements

Figure 12 illustrates the year-by-year hiring requirements forecast for the mining supply services sector under a baseline scenario. The mining support services sector is expected to respond to changing developments in the mining and exploration sectors. The forecasts for this sector show positive hiring requirements with the largest segments of hiring needs are expected to come from net change in employment gains in the short-term and non-retirement separation over the forecast horizon.

Figure 12 – Annual Hiring Requirements Forecast, Mining Support Services, Baseline Scenario – 2014 to 2024

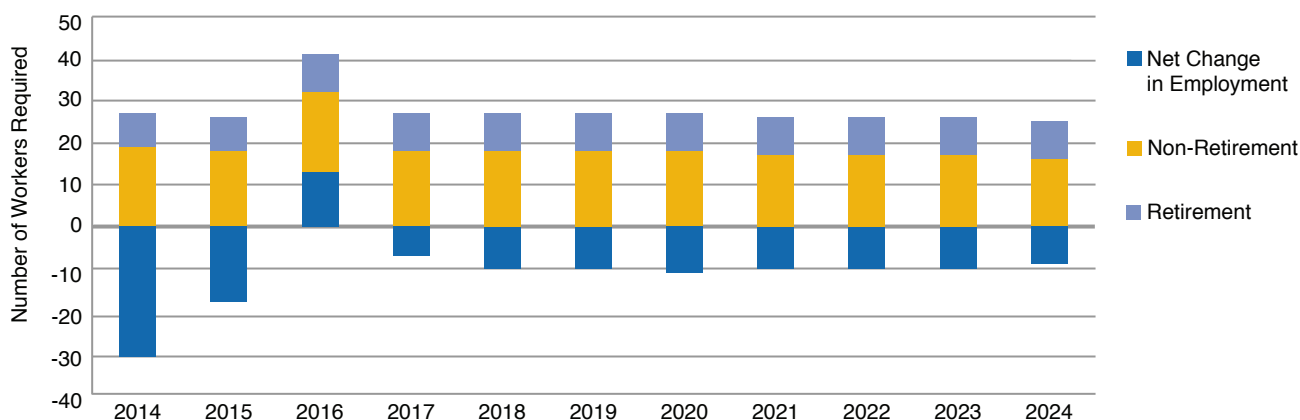


Source: Mining Industry Human Resources Council, 2014

Mineral Exploration Sector Hiring Requirements

Figure 13 illustrates the year-by-year hiring requirements forecast for the mineral exploration sector under a baseline scenario. The net change in employment is expected to be negative over the forecast horizon due to a slow economic outlook and the cautious mood amongst investors in the exploration sector. However, the impact of net change in employment is projected to be large in the short-term of the forecast with a return to a steady state. Non-retirement separation exhibits the largest segment of hiring needs.

Figure 13 – Annual Hiring Requirements Forecast, Mineral Exploration, Baseline Scenario – 2014 to 2024



Source: Mining Industry Human Resources Council, 2014



5. Available Talent

5. Available Talent

Available Talent describes the potential talent pool for the industry to fill positions and offset their hiring requirements. The hiring requirement forecast (described in Section Four) estimates the number of hires the industry will need in order to keep production at a competitive level over the next 10 years. This primarily depends on anticipated economic conditions and demographic factors; however, in order to fully understand labour market pressures, the hiring requirements model must be balanced with an estimate of the workforce that, under normal conditions, is expected to be available to fill positions.

MiHR has developed a model of labour supply that projects the amount of talent that will be available to fill positions over the forecast horizon. The forecast is based on historical patterns and assumes the existing state of affairs will continue through the time horizon. Thus, by not making assumptions about momentous strategies and policies yet to be instigated, the available talent forecast exposes labour pressures as they are expected to evolve today.

Forecasting available talent in this way for Nunavut presented unique and notable challenges. First, the model draws upon recent historical data; however, the recent history of Nunavut's mining industry is relatively small-scale and sporadic. Thus, the mining landscape at the start of the forecast is radically different from a few years earlier. Further, as the share of Nunavut's commuter workforce (i.e., those working in the territory but living elsewhere) is extremely high, estimating the available talent among this segment is considerably more challenging. For the purpose of this report, information on available talent has been aggregated to the broad occupation level to preserve the integrity of the reported information.

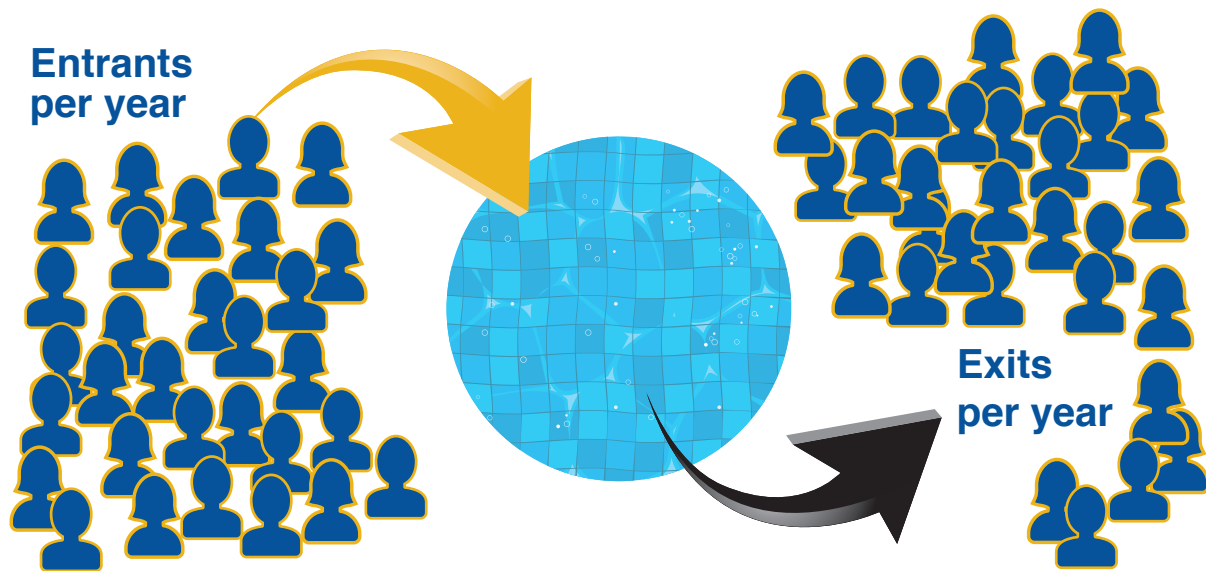


Description of the Model

MiHR's model for Available Talent is produced for 42 occupations identified to be critical to the mining industry. The model first projects, for each occupation, the pool of labour that the mining industry is expected to draw from and then predicts the proportion that the mining industry will successfully attract in a given year. The share that the mining industry is predicted to attract is based on historic patterns and reflects the industry's traditional capacity to attract talent compared to all other industries drawing from that same occupation pool. Note that this proportion varies among occupations depending on how specific an occupation is to the mining industry. The share of talent that an industry attracts is typically stable over time.

Forecasts of the labour pool were prepared for selected mining-related occupations of interest (see Appendix C for a complete list). In a given year, the forecast begins with the previous year's labour pool, and then considers the flows of workers projected to enter and exit during the course of the year. A detailed description of the model and its assumptions can be found in Appendix B.

The Labour Pool for Mining-Related Occupations



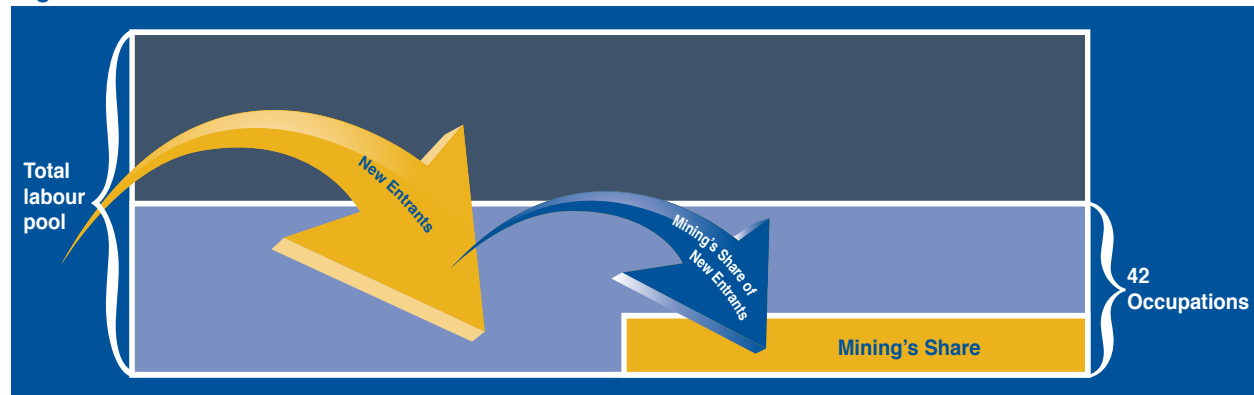
Entrants: The main sources of new entrants include individuals leaving high school or post-secondary school to join the workforce; individuals coming to Nunavut from other countries (international migration) or other provinces (interprovincial migration); and “others” such as people changing occupations and those re-entering the workforce after a temporary absence.

Exits: The sources of labour force exits include individuals leaving Nunavut to work in other countries or other provinces; workers who have retired; and “others,” such as people changing occupations or those who fall ill, are disabled, or deceased.

Available Talent Forecasts

The Available Talent forecast specifically refers to the new entrants to the labour pool – in other words, workers who will potentially offset the industry's hiring requirements. As illustrated by Figure 14, not all individuals entering a particular occupation (e.g., steamfitters) will work in mining. For the selected occupations, MiHR first estimates the number of new entrants that will be available in the labour pool for all industries (the large yellow arrow) and then calculates mining's share of these entrants (the small blue arrow) — based on historic trends. The cumulative number of workers that the mining industry will attract describes the available talent figures presented in this report.

Figure 14 – An Illustration of the Labour Pool and Available Talent



Source: Mining Industry Human Resources Council, 2014

Even though the forecast assumes a continuation of past trends in the forecasting period, it is possible that the status quo will evolve as new education and training programs and industry/education initiatives are introduced to address the currently projected gaps. It is therefore important to revisit the forecasts and gap analysis on a regular basis, to update assumptions and to track the impact of new initiatives on the gaps and analyses presented here.

Table 6 presents the forecast of available talent over a two-, five- and 10-year time horizon. For all industries in Nunavut, approximately 1,280 new entrants are projected to enter the key mining-related occupations over the next 10 years. Assuming that mining will continue to attract talent at historical rates for these occupations, the mining industry is expected to attract 120 new entrants in those occupations over the coming decade.

Table 6 – Cumulative Available Talent, All Industries and Mining, 42 Occupations – 2016, 2019, 2024

	2016	2019	2024
Total entrants for select occupations, for all industries	340	710	1,280
Mining's share of entrants for select occupations (assuming historical rate of attraction)	20	60	120

Source: Mining Industry Human Resources Council, 2014

Available Talent Forecasts by Occupation

Table 7 shows mining's share of the cumulative available talent over the next 10 years, by broad occupational category. The table also highlights the total available talent across all industries, along with the percentage that Nunavut's mining industry has historically attracted from each category.

The historical data, upon which these estimates were derived, indicates that Nunavut’s mining industry captured very few workers in many of the key occupational groups. To the extent that the historical data is current with Nunavut’s industry in 2014, the estimates of mining’s share point to an industry that will continue to be challenged to find workers. In other words, maximizing education and training opportunities, attracting new talent and growing the available talent pool will be essential for the industry to meet its hiring needs.

Table 7 – Cumulative Available Talent, by Broad Occupational Categories – to 2024

	Mining’s Share of Available Talent (Number of Workers)	Total Available Talent, All Industry’s (Number of Workers)	Mining’s Historical Share of Available Talent (Per cent)
Trades and Production Occupations	100	660	15%
Professional and Physical Sciences Occupations	< 5	40	< 1%
Human Resources and Financial Occupations	< 5	220	< 1%
Support Workers	10	280	4%
Technical Occupations	< 5	20	< 1%
Supervisors, Coordinators, and Foremen	< 5	60	< 1%

Source: Mining Industry Human Resources Council, 2014

Labour Market Pressures

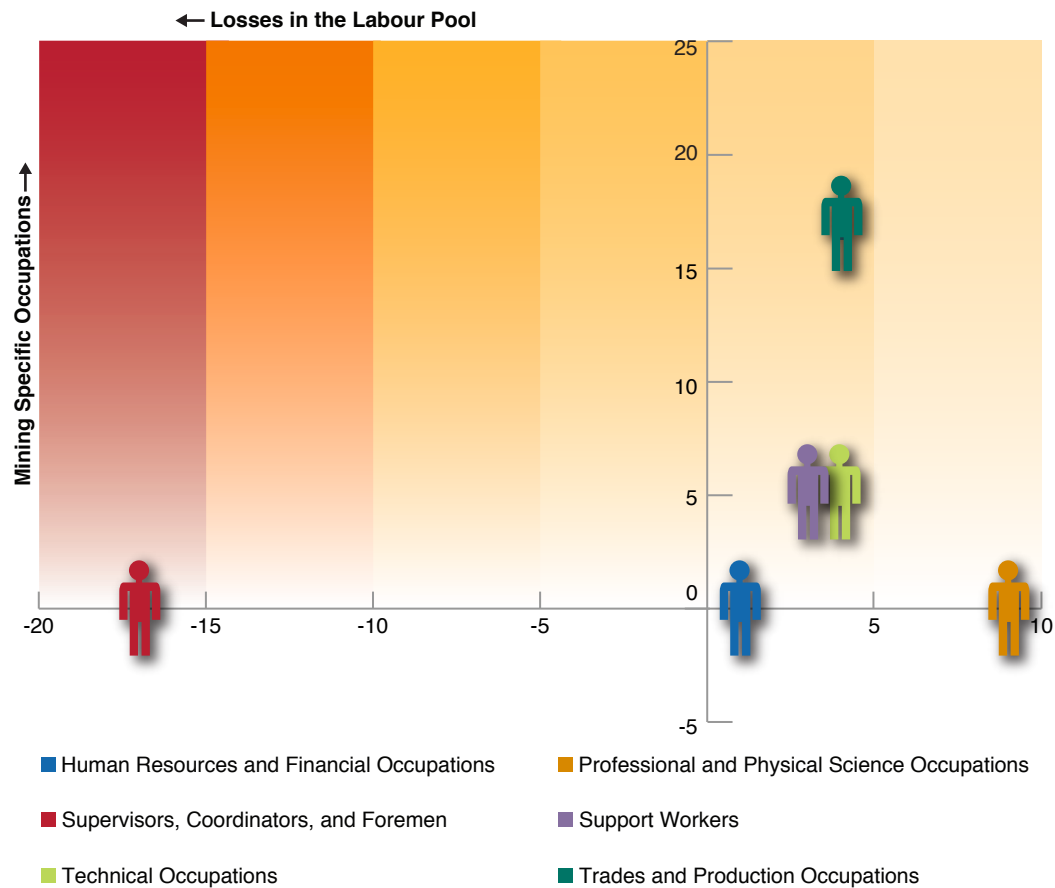
The degree to which talent is difficult to find can vary between occupations. For the mining industry, the pressure to find talent for a particular occupation can increase because (1) the labour pool for that occupation shrinks over time, and/or (2) the mining industry relies heavily on that occupation and is therefore sensitive to changes in its labour force.

Some occupations (e.g., carpenters) are typically found in other industries and the mining industry accounts for a small share of total employment in those occupations. Other occupations (e.g., underground miners, mining engineers) are very industry-specific and for these, the mining industry accounts for the majority of total employment. Taking a closer look at the pressures in the talent pools for each occupation gives the mining industry important information about future challenges and opportunities.

Figure 15 provides a visual representation of the relative pressures in the different occupational talent pools — whether a particular pool is growing or shrinking and what that means for the mining industry — based on how industry-specific the occupation is. In this figure, the highest pressures are felt in the top left quadrant where an occupational group becomes increasingly relevant to the mining industry and is projected to experience a shrinking labour pool.

This illustration should not be confused with a gap analysis. It does not take into account projected hiring requirements; it simply illustrates projected trends in various talent pools as a function of how much of that talent pool is employed in mining.

Figure 15 – Labour Pool Pressures, by Broad Occupational Group



Source: Mining Industry Human Resources Council, 2014

Available Talent Forecasts by Industry Sector

A sector-specific analysis of available talent is possible to the extent that occupations are assumed to belong to a particular industry sector. For example, available talent for occupations such as underground miners will likely impact production, while available talent for geologists are expected to impact mineral exploration.



6. Talent Gap Analysis

6. Talent Gap Analysis

Understanding the gaps between hiring requirements and available talent is important, as it can inform development of targeted strategies and initiatives to fill the gaps. To this end, MiHR’s gap analysis provides a side-by-side comparison of hiring requirements and available talent for the key occupational groups that are core to Nunavut’s mining industry. The gap analysis brings together outcomes from previous sections in this report to determine the gaps between hiring requirements and available talent. Given that available talent is a forecast based on an occupational basis, the occupation-level hiring requirements forecast (as reported in Section Four) is used to provide an appropriate comparison.

Table 7 summarizes the projected gaps for the selected occupations combined. The forecast predicts the cumulative available talent will not be sufficient to meet the forecasted hiring requirements, assuming the status quo will continue. Specifically, the industry is expected to attract only 120 new entrants to meet hiring needs of 1,470 - leaving a shortfall of 1,350 workers by 2024.

Table 7 – Cumulative Available Talent, All Industries and Mining, Selected Occupations – 2016, 2019, 2024

	2016	2019	2024
Mining’s Share of Entrants for Selected Occupations (assuming the historical rate)	20	60	120
Hiring Requirements for Selected Occupations	195	405	790
The Gap	-175	-345	-670

Source: Mining Industry Human Resources Council, 2014

*Note: To ensure appropriate comparisons, these figures do not include the full industry-wide hiring requirements forecast, but rather only the forecast for broad occupational groups to be consistent with available talent forecasts.

Occupational Gap Analysis

The nature of talent gaps varies among occupations. In some cases, there is an existing pool of talent and the industry must strive to attract more new entrants from this pool into mining careers (i.e., carve out a larger slice of the pie). In other cases, there simply aren’t enough people in the talent pool to meet the industry’s needs, let alone the demands from other industries (i.e., there is a need to make the pie larger). In all cases, the mining industry must strive to retain the workers it already employs and to make the best possible use of talent (e.g., through technology, innovation, improved productivity and appropriate skills and knowledge development).

A talent gap can also have a different impact, depending on the occupation. This is especially true for jobs that are highly specialized and require years of training and experience. A seemingly small gap can pose a challenge when there are only a few people with the specialized skills and experience to perform the role. The analysis presented in this report presents gaps in terms of raw numbers, but this analysis should be balanced with the awareness that not all the illustrated talent gaps are mission-critical or high-concern gaps.

Table 8 provides the side-by-side comparison of hiring requirements and available talent. The size of the talent gaps varies among the occupational groups considered in this report. Among these categories, the *Trades and Production Occupations* collectively exhibit the largest gap between hiring requirements and available talent.⁶

Table 8 – The Gap and Challenge, by Broad Occupational Categories – to 2024

	The Need	Available Talent & Gap		The Challenge		
	Cumulative Hiring Requirements	Available Talent – Mining’s Share	Gap	Total Available Talent – All Industries	Mining’s Share	Mining’s Required Share
Trades and Production Occupations	505	100	-405	660	15%	77%
Professional and Physical Sciences Occupations	60	< 5	-60	40	< 1%	150%
Human Resources and Financial Occupations	5	< 5	-5	220	< 1%	2%
Support Workers	80	10	-70	280	4%	29%
Technical Occupations	60	< 5	-60	20	< 1%	300%
Supervisors, Coordinators, and Foremen	80	< 5	-80	60	< 1%	133%

Source: Mining Industry Human Resources Council, 2014

*Note: To ensure appropriate comparisons, these figures do not include the full industry-wide hiring requirements forecast, but rather only the forecast for broad occupational groups to be consistent with available talent forecasts.

As shown in Table 8, the lack of available talent is a primary concern for the industry’s ability to meet its hiring needs. Historically, the incoming supply of talent is essentially absent. Without an extraordinary movement to increase the labour pool and capture more workers into the industry, this trend is projected to continue over the forecast. Improving upon the available talent numbers presented will be an important step to narrowing the gap. This also emphasizes the need to continue to supplement the workforce with commuters and to attract talent from other regions.

Types of Talent Gaps

The cumulative talent gap alone does not shed light on how best to address the labour shortages. The unique characteristics of the gaps within each of the occupational categories must first be analyzed and trends among occupations identified.

⁶ Table 8 can be used to gauge the degree that the industry needs to change its historical share in order to meet its future hiring needs. For example, Support Workers have an available talent forecast of 280 –for all industries. Of that number, the mining industry is projected to attract 4 per cent based on historical patterns, yet the industry is projected to require 29 percent of what is available to all industries. Note that for many of the occupational groups in Nunavut, the need is well over 100 per cent of what is available to all industries.

Three distinct types of occupational gaps can emerge from the gap analysis table presented above. These trends can be characterized as the following:



1. Retain and Develop the Workforce: For these occupations, the labour supply is sufficient for the forecasted labour needs and strategic efforts should focus on retaining the workforce through engagement, retention and development initiatives. Nunavut does not have an example of an occupation in this category. Therefore the strategy to meet hiring needs must go beyond normal efforts to retain and engage talent.

2. Increase Mining’s Share of Labour Pool: For the occupational groups with this type of gap, there is a healthy labour pool to draw from, but mining does not attract enough of them to meet future need. For these occupations, the industry faces fierce competition from other industries — all in need of workers with similar skills, knowledge and experience. As a result, the mining industry must compete to capture a larger share of the pool through strategic efforts to attract new labour market participants into careers in mining.

In Table 8 above, *Trades and Production Occupations, Support Worker Occupations and Human Resource and Financial Occupations* are forecasted to attract enough talent in all industries to support the needs of Nunavut’s mining industry; however, historically the mining industry has not attracted enough of the available talent. The industry must therefore increase its share of the available labour pool by focusing strategic efforts on awareness of opportunities within the mining industry. Many of these occupations are not mining-specific, therefore, the industry must increase not only awareness among these talent pools but ultimately, preference for mining career opportunities.

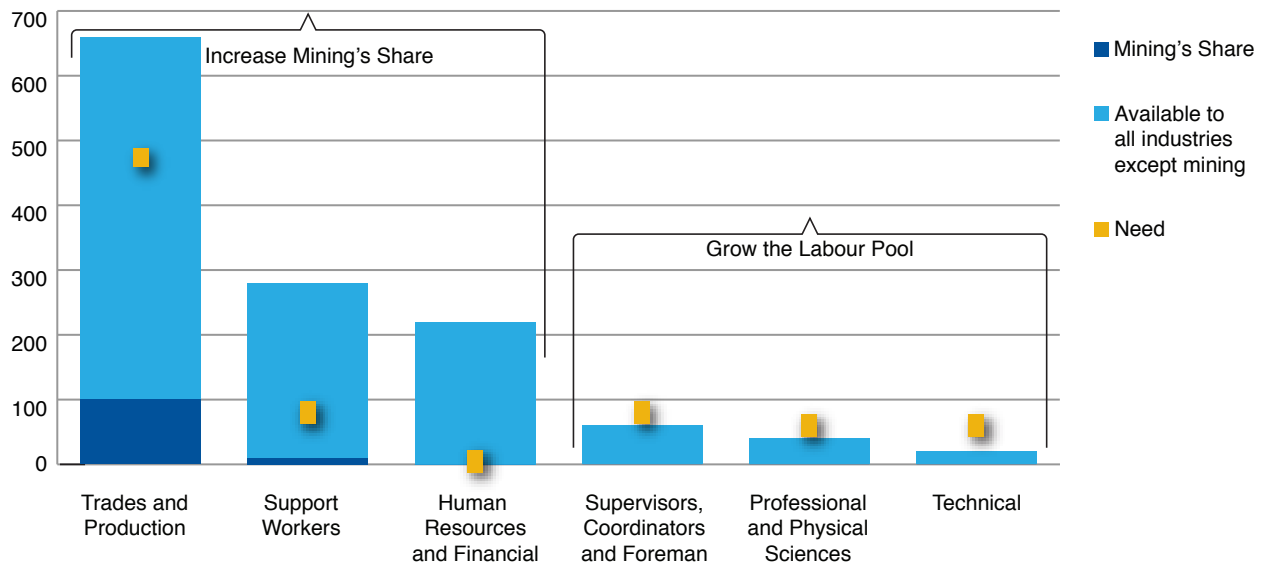
3. Grow the Labour Pool: For many mining-specific occupations, there simply will not be enough new talent entering the labour pool over the next 10 years to meet hiring needs. These occupations require considerable growth in the labour pool in order to meet the forecasted requirements. In many cases the deficits are large. For example, Table 8 shows that the available talent of *Supervisors, Coordinators, and Foremen* needs to more than double in order for Nunavut’s mining industry to have a large enough pool to draw from — even if this was the case, the industry has not historically attracted many workers in this category.

For this type of gap, the industry may have to collaborate with other industries, educational institutions, immigration offices and others to increase the available talent pool for all industries. It is important to note that solutions to these gaps involve real increases in new talent — in other words, workers who are not already employed in the sector. When labour market conditions tighten, a natural reaction is to compete with other mining employers to fill positions with workers already employed in the sector. This tactic does not address the labour pool deficits as it only shuffles current employees among employers.

As shown in Table 8, *Professional and Physical Sciences Occupations, Technical Occupations and Supervisors, Coordinators, and Foremen Occupations* all point toward labour pool deficiencies. For these occupations, the forecasted available talent would not be sufficient to support the needs of the mining industry, even if the industry was able to attract 100 per cent of the available talent.

Figure 16 offers a visual representation of the gaps presented in Table 8. The columns represent the available talent for all industries; the dark blue segments represent mining's share of available talent; the yellow squares denote the hiring requirements. In all cases the hiring requirements (yellow) outstrip mining's share (dark blue), indicating a talent gap for that occupational group. In most cases (except for *Trades and Production Occupations*, *Support Worker Occupations* and *Human Resources and Financial Occupations*), the hiring requirements also surpasses available talent for all industries. Finally, there was no instance whereby mining's share was found to fully accommodate the hiring requirements.

Figure 16 – Projected Gaps, by Broad Occupational Categories – to 2024



Source: Mining Industry Human Resources Council, 2014

Addressing the Gaps

Just as the nature of the talent gaps differ, so too do the strategies to address the gaps. There are many initiatives, partnerships and programs that will ensure the industry is well positioned to meet its needs. Students can be encouraged to remain in the territory and work in the industry after graduation, perhaps even coordinating efforts with other industries, provinces/territories and countries. The mining industry could further grow the labour pool and optimize the existing workforce by developing the capacity to train workers in time to meet the escalating demand. Retraining and re-engaging older workers could delay retirements enough so that new generations can acquire the skills and competence to maintain business operations.

Increase Mining's Share of Available Talent

Increasing the share of talent for any one industry is a difficult undertaking. As the labour market tightens, it becomes exponentially more difficult for a particular industry to attract more new entrants in the face of competition from other industries. In addition, the ability of the mining industry to attract talent from other sectors can be limited by unfavorable public perceptions about mining's social and environmental impacts. This includes factors related to working or living in remote locations (e.g. high cost-of-living, access to recreation and leisure activities and the pressures of a fly-in-fly-out lifestyle).

Elsewhere in Canada, tight labour markets have driven employers to offer more competitive salaries, increase benefits and attempt to attract new talent with perks, bonuses, more vacation time and other incentives. While these strategies may result in short-term gains, they can be costly and not sustainable over the longer-term. Employers may also look to compete for talent within their own local industry; but this essentially moves around talent that is already employed, as opposed to increasing an industry's share of new entrants to the labour force.

Growing the Labour Pool

In addition to attracting more talent from an available pool, mining industry stakeholders will need to increase the number of new entrants to Nunavut's overall mining labour pool in order to meet forecasted hiring requirements. Growing the talent pool will require employers, educational institutions, government and associations to coordinate their efforts to attract people at all entry points. This includes developing the local workforce for mining opportunities, boosting education and training to increase the numbers of school graduates, embracing collaborations/partnerships with communities in the territory and developing and improving infrastructure (e.g., roads, housing, proper schooling, internet access, affordable airfare, healthcare) to better engage and increase the local labour force's access to mining opportunities. Continued efforts to increase the local talent pool will also reduce the dependency on commuters to meet the need for skilled workers; however, in the short-term, both the local workforce and the commuter workforce are essential to Nunavut's mining labour pool (and the strategies to increase its size).

Education and Training

Education and training institutions are essential partners in creating solutions. Initiatives to support and continue these important partnerships are a critical element in finding solutions. Nunavut's mining industry has worked closely with territorial and local governments and training institutions to address workforce needs. In addition, mining stakeholders have invested in in-house training programs to develop the talent they need.



Companies and communities often struggle to match individuals with jobs due to a lack of essential and technical skills training. In order to fully engage communities in mining, it is important to provide industry validated education in local communities. For example, *Mining Essentials: A Work Readiness Training Program* for Aboriginal peoples, teaches essential skills, attitudes and industry knowledge using culture and industry contexts. The Program is customizable both to cultural aspects in various regions and to the needs of employers.

When planning to fill the talent gaps, it is important to take into consideration the time it takes to train and develop the needed experience to be fully competent on the job. Therefore, overcoming supply pressures might be challenging, or unfold over a longer time horizon than discussed here. For some occupations (e.g., for underground mine service and support workers), the ability to train and develop talent will be manageable if immediate action is taken. For other occupations, a blend of short-term and longer-term solutions will be needed (e.g., professional geoscientists).

Workforce Optimization

Workforce optimization and strategic workforce planning ensure that the current workforce is well-tuned and functioning at its best, despite a tightening labour market. Workforce optimization analysis should not be confused with downsizing or other reactionary workforce adjustments. Rather, it is a joint analysis of workforce management, organizational design, technology, equipment, employee training and development and business outcomes. The approach is meant to ensure strategic planning and continuous improvement to support the existing workforce—encouraging communication and partnerships amongst all stakeholders.

Over time, the ideal strategy for optimization can shift. For instance, fundamental changes in technology can have an impact on the mandatory skills of employees, causing the industry to refocus and identify which skills are necessary. In this case, educational institutions must adapt their programs with the industry needs. The main goal of optimization analysis and design is to ensure that challenges are identified early and all stakeholders are coordinated in addressing issues.

Industry Churn and the Commuter Workforce

Nunavut's mining industry currently depends on commuters to supplement the need for skilled workers, yet retaining a large commuter workforce can be a challenge considering that commuting workers have access to employment options in other regions of the country, including their own place of residence. Also, the likelihood that commuters will be retained diminishes given that certain mining activities are seasonal and often take regular pauses.

The industry can mitigate attrition among the commuters by investing in their employees and increasing opportunities for professional development. For example, MiHR's *Canadian Mining Certification Program* (CMCP) provides workers with a professional credential and formal recognition of their skills, competencies and experience in the industry. The program currently offers two levels of certification and therefore creates opportunities for career development, planning and growth, which help to keep employees motivated and engaged in the industry. Efforts to adopt more flexible schedules to accommodate family obligations and work-life balance for those that fly-in-fly-out can also improve their willingness to endure the high travel demands.



The commuter workforce is currently a reality for Nunavut’s mining industry, but in the long-term, the local workforce can decrease pressures to find skilled workers in other jurisdictions. Increasing the work readiness of the local population over time will open Nunavut’s labour force to new opportunities and ensure long-term growth and prosperity.

Next Steps

This report is intended to provide a foundation for understanding the unique labour market conditions and outlook for Nunavut’s mineral exploration and mining industry. Findings and gap analysis can be used to support and develop targeted solutions in a coordinated and strategic manner. That said, this research has highlighted several issues that warrant further study, including:

- Better understanding of the social and economic impacts of a large commuter workforce.
- Inuit are an important segment of Nunavut’s mining workforce force; however, they are generally employed in entry-level positions—a better understanding of the “glass ceiling” for career progression, education and skills development of the Inuit in the territory will ensure that future vacancies in all occupational categories can be filled with local community workers as the primary source.
- A broader understanding of the social and economic impacts of rapid industry growth and development on infrastructure, education and training and communities—including a deeper knowledge of the transition the industry will face in terms of the activities, supports and structure of the labour force over time.
- Examine the use and receptiveness to careers attraction tools like *Explore for More Nunavut*, MiHR’s industry brand and toolkit for mining careers, licensed by Nunavut. The brand and career profiles were customized to feature members of the Nunavut mining workforce and also translated into Inuktitut.

- A thorough catalogue and analysis of the supports and services available to encourage and retain Nunavut's small and medium sized enterprises that provide supports to the exploration and mining industry.
- A detailed study and analysis of special populations of labour supply and barriers to inclusion in the industry, to ensure all sources of talent find opportunities in the industry. For example, women are a rapidly growing segment of Nunavut's mining workforce and a young mining sector has a rare opportunity to encourage women into trades and ensure that barriers to inclusion are identified and eliminated early.
- Effective approaches and initiatives to attract and engage workers from other provinces and countries— identify what career awareness, mentoring and recruiting initiatives are possible and how will they address labour shortages. This is in view of the fact that, presently, there are simply not enough educated and trained workers in the local workforce, especially for certain skilled occupations. By effectively engaging the non-resident workforce at present, the resident workforce will have the time and resources to properly prepare and develop their skillsets.
- Revisit forecasts and gap analysis on a regular basis to adjust for rapidly changing conditions and track progress of initiatives to address the gaps.

Summary

Nunavut's mining industry has experienced considerable growth over the last decade. Looking forward, mining will continue to be an integral part of economic success in the territory, though industry growth is expected to stabilize over the next decade. Looking beyond the 10-year horizon, there are promising projects in the pipeline – in the event that any one of these projects comes online, the recent sudden growth will be repeated.

This report points to the key labour market pressures that have the potential to derail future progress of the recent economic growth in Nunavut's mining industry. If certain commodities recover sooner than expected (i.e., the gold market), the timeline to respond will accelerate. MiHR's hiring requirements forecast includes both contractionary and expansionary scenarios to highlight the possible impacts on the industry's hiring needs.

The preparedness of stakeholders will determine the extent that Nunavut's mining industry is able to respond to labour market pressures. This includes adopting strategies to grow the talent pool – developing the skills of local workers and reducing the industry's reliance on the commuter workforce. A combination of approaches is important to ensure the future sustainability and success of the industry.



Appendices

Appendix A

Methodology

This appendix outlines the methodology used by MiHR to produce forecasts of hiring requirements in the mining industry. It also describes the various data that were required, along with the development of the forecasting models. A flowchart depicting this methodology is provided in Figure A1.

Forecasting models of employment were estimated based on the following six steps:

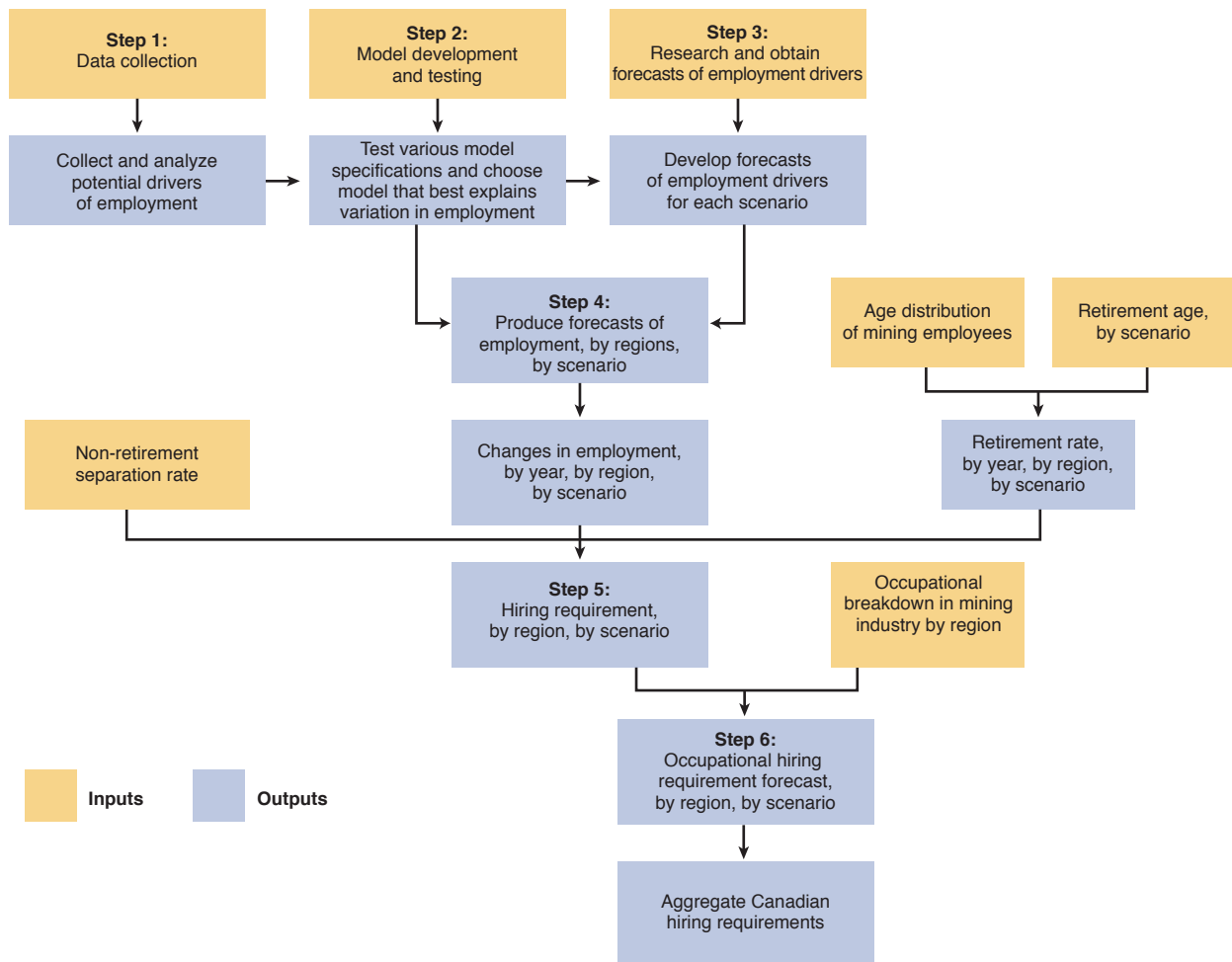
- Step 1: Collect and analyze data that may potentially explain changes in the number of jobs in each region.
- Step 2: Determine the driver(s) that explain the greatest level of variation in the number of jobs in each region by testing various model specifications through regression analysis.
- Step 3: Produce baseline, contractionary and expansionary forecasts for each driver determined in Step 2.
- Step 4: Combine Steps 2 and 3 to produce the forecasts for employment under baseline, contractionary and expansionary scenarios.
- Step 5: Produce forecasts of the total hiring requirements given the change in employment (determined in Step 4) and estimates of retirement and non-retirement separation rates.
- Step 6: Calculate and apply occupational coefficients to produce estimates of hiring requirements by occupation.

Several indicators were considered as explanatory variables for predicting employment. MiHR's hiring-requirements forecasting model combines the effects of changes in commodity prices, growth of mining GDP, labour productivity, retirement rates, non-retirement separation rates and other economic variables to produce estimates of hiring requirements over the next 10 years.

In addition, MiHR partnered with the Government of Nunavut and various mining employers and stakeholders in the region. Employers provided inputs on the size and age profile of their workforces, turnover and separation patterns they observe and discussion on other HR challenges and labour market issues they face. In addition, surveys were conducted asking for inputs on the size and profile of their workforces and future hiring needs. Findings were used to verify and adjust employment estimates, validate forecasts and augment the assumptions for the forecast scenarios.

Figure A1

Employment and Hiring Requirements Forecasting Model



Source: Mining Industry Human Resources Council, 2014

Appendix B

MiHR's model of Available Talent for each occupation starts with the existing supply, adds in new entrants and then subtracts people who leave. The model assumes three main sources of new entrants: school leavers, migrants and "others"; the latter group consists generally of people who switch occupations or re-enter the workforce after temporarily leaving it. The model also assumes three paths of departure from the workforce of a specific province or territory: moving to another province/territory or another country; retiring; and leaving for other reasons, which include transferring to another occupation, temporarily leaving the workforce, disability or death.

Model Inputs and Assumptions

Model inputs come from a combination of sources. Due to the level of detail required for these analyses, it was necessary to use census data. The census is the most detailed source of employment data available from Statistics Canada. It provides the simultaneous breakdown of employment by industry, region, occupation and other required demographic detail. The major weakness of the census data is that it is compiled only once every five years and the most recent census data available is from 2006. As such, the forecast for supply data begins in 2007. Where possible, more recent data (e.g., from the Labour Force Survey and the National Household Survey) is incorporated into the forecast, to verify and validate the estimates from 2007 to 2011.

Employment by Occupation

MiHR generates estimates of employment, retirements and "other" exits by occupation, as part of its hiring-requirements forecasts. Employment outlooks for each occupation in mining were tied to MiHR's employment forecasts. Employment estimates for each occupation in other industry sectors were tied to The Conference Board of Canada's provincial forecasts for non-mining sectors.

Employment by occupation is used to help estimate migration patterns in the model. Employment for each occupation is divided into two categories: the mining industry and other industries. The census data provides information on the starting points of these two series. The mining portion of employment is taken from MiHR's mining-employment forecasts and employment for all other sectors is taken from The Conference Board of Canada's employment forecasts. These results are then summed to generate total employment by occupation.

The underlying assumption behind this methodology is that occupational employment in the mining sector will grow at the same pace as the entire mining industry and that occupational employment outside of the mining sector will grow at the same pace as the rest of the economy. This is a reasonable assumption, as it implies that the share each occupation has—both within the mining sector and within the rest of the economy—will remain constant.

Migration

Net international migration forecasts are based on estimates of net international migration for Canada by occupation, taken from Employment and Social Development Canada's (ESDC's) (formerly Human Resources and Skills Development Canada) Canadian Occupational Projection System (COPS) model. Nunavut's share of international migration flows, relative to the national average, is based on the relative strength of its labour market.

Net interprovincial migration is based on the balance of inflows and outflows of workers in a particular occupation in Nunavut, relative to the Canadian average. This assumes that a surplus of workers (a “soft labour market”) leads to net outward migration, while a lack of workers (a “tight labour market”) leads to a net inflow of workers to the province. According to modelling done by The Conference Board of Canada (CBoC), the unemployment rate in a region is an important determinant of migration flows and the gap between supply and demand is a proxy for the unemployment rate for each occupation.

The forecasts of employment by occupation are used to generate net migration estimates for each occupation. Interprovincial and international immigration by occupation is known from the census. To forecast immigration, the share of immigrants by occupation, relative to total immigration, is kept constant over the forecast period and applied to the CBoC’s provincial forecast for immigration by province. This is done for both interprovincial and international immigration.

This methodology incorporates the relative mobility of each occupation into the forecast. Occupations where people have historically been less likely to move will continue to display this characteristic and those with historically higher levels of mobility will continue to behave in a similar manner. Also, by tying the forecast to the CBoC’s existing forecasts for provincial immigration, this methodology incorporates a measure of the attractiveness of a region. The CBoC’s forecasts are dependent on the relative tightness of a region’s labour markets and its historic ability to attract migrants.

School Leavers

The forecast of school leavers is generated using two methods. The first method is based on the occupation’s historic ability to attract people leaving school; if a certain share of the population under the age of 25 has historically entered a particular occupation, it is assumed that the share of entrants will remain similar going forward. Thus, the number of new entrants depends on the age profile of the territory’s workforce. School graduation figures and forecasts for specific occupations are also considered.

Second, to estimate the number of school leavers by occupation, the educational attainment of workers aged 25 to 34 is used to establish the education profile for each occupation. The census provides the most recent data on the number of workers by age group, occupation and highest certificate, diploma or degree obtained. This information is combined with demographic data for the territory to estimate the number of school leavers per occupation. An estimate of how attractive a particular occupation is to school leavers is also applied for each occupation. Finally, estimates of how many school leavers will enter the workforce every year are created. School leaver estimates are calculated for three broad levels of education: high school diploma or lower; trade, college or other post-secondary education below the bachelor’s degree level; and university degree.

Retirements

Retirement leavers are estimated using MiHR’s forecasted retirement rates by province and territory. Consistent with MiHR’s existing model, the retirement rate is assumed to be the same across all occupations. Retirement rates are forecasted by first estimating the probability that an individual will retire from the labour force in a given time period. This will depend on many factors, most notably the individual’s age and educational background. This behavioural estimation is then applied to the mining labour force, capturing its unique demographic characteristics.

Other Entrants

The last group of new entrants is the “other” category, which largely consists of new people entering from other occupations or re-entering the workforce. Given the degree of training required for many of these occupations, it is very likely that these entrants would be already trained in that occupation. For simplicity, the number of new entrants is assumed to be a certain percentage of the existing labour force. This rate is set equal to the “other” leavers’ rate that MiHR uses as part of its existing models and is constant across occupations for a particular province. In this manner, “other” entrants are precisely equal to and offset “other” leavers.

Other Leavers

Other leavers include people moving to other occupations, people temporarily leaving the workforce, and mortality. The leavers’ rate is sourced from MiHR’s existing models. The model then assumes equilibrium in “other” labour mobility, thus the model matches “other” exits with “other” entrants.

Appendix C

This appendix lists the North American Industry Classification Codes (NAICS) and National Occupational Classification (NOC) codes used throughout this report to define the mining industry. MiHR is engaged in ongoing, iterative research to include more NOC codes in this definition of the sector and to better capture Statistics Canada data related to the mining industry workforce.

Industry Definition and Scope

Statistics Canada, the main source of Canada's labour market information, uses two different coding systems to classify data: the North American Industry Classification System (NAICS) and the National Occupational Classification (NOC). Both systems provide a hierarchical structure that divides higher-level categories into more detailed categories in order to group similar establishments and individuals.

NAICS codes are used by statistical agencies throughout North America to describe economic and business activity at the industry level. The system features a production-oriented framework where assignment to a specific industry is based on primary activity, enabling it to group together establishments with similar activities.

The NOC system was developed by Statistics Canada and Employment and Social Development Canada (ESDC, formerly Human Resources and Skills Development Canada) to provide standardized descriptions of the work that Canadians perform in the labour market. NOC codes organize labour force participants according to the nature of work they perform, thereby enabling similar occupations to be grouped. NOC codes are specific to Canada.

There is no single NAICS code that directly corresponds to all phases of the mining cycle (which includes exploration, development, extraction, processing and reclamation). Similarly, there is no single set of NOC categories that pertain to only mining. People employed in occupation groups that are prevalent in mining also work in a variety of other industries. Together, the NAICS and NOC systems provide a means for grouping statistics to obtain estimates of employment and workforce demographics using Statistics Canada data sources. A full description of both classification systems can be found on Statistics Canada's website.

The Mining Sector, Industry Classifications

MiHR has defined the sector according to the following NAICS codes, thereby providing the best correspondence between the industry's main primary and processing activities as defined by Natural Resources Canada. Note that certain NAICS codes listed are not relevant to Nunavut's mining industry. These are not included in the forecasts presented in this report. The list below describes the NAICS codes considered and underlines the ones relevant to Nunavut's mining industry. The NAICS codes that define the mining industry include:

- NAICS 2121: Coal mining. This industry group comprises establishments primarily engaged in mining bituminous coal, anthracite and lignite by underground mining, and auger mining, strip mining, culm bank mining and other surface mining.

- NAICS 2122 Metal ore mining. This industry group comprises establishments primarily engaged in mining metallic minerals (ores). Also included are establishments engaged in ore dressing and beneficiating operations, whether performed at mills operated in conjunction with the mines served or at mills, such as custom mills, operated separately.
- NAICS 2123 Non-metallic mineral mining and quarrying. This industry group comprises establishments primarily engaged in mining or quarrying non-metallic minerals, except coal. Primary preparation plants, such as those engaged in crushing, grinding and washing, are included.
- NAICS 2131 Support activities for mining and oil and gas extraction. This industry group comprises establishments primarily engaged in providing support services, on a contract or fee basis, required for the mining and quarrying of minerals and for the extraction of oil and gas. Establishments engaged in the exploration for minerals, other than oil or gas, are included. Exploration includes traditional prospecting methods, such as taking ore samples and making geological observations at prospective sites.
- NAICS 3311: Iron and Steel Mills and Ferro-Alloy Manufacturing. This industry group comprises establishments primarily engaged in smelting iron ore and steel scrap to produce pig iron in molten or solid form.
- NAICS 3313: Alumina and Aluminum Production and Processing. This industry group comprises establishments primarily engaged in extracting alumina.
- NAICS 3314: Non-Ferrous Metal (except Aluminum) Production and Processing. This industry group comprises establishments primarily engaged in smelting, refining, rolling, drawing, extruding and alloying non-ferrous metal (except aluminum).
- NAICS 5413: Architectural, engineering and related services. This industry group comprises establishments primarily engaged in providing architectural, engineering and related services, surveying and mapping, laboratory and on-site testing, and specialized design services. Note that only a portion of this NAIC code relates to Geosciences, Surveying and Mapping, and Assay Laboratories).

Occupation Classification

Listed below are the 66 NOC codes that MiHR uses to define the occupations that are relevant to the mining industry. The occupation titles listed below are those used in the Statistics Canada system. Note that certain NOC codes listed are not relevant to Nunavut's mining industry and are therefore not included in the forecasts presented in this report. The list below flags (with an asterisk) the NOC codes that are relevant to Nunavut's mining industry (42 NOC codes).

Often an occupation can have multiple titles and Statistics Canada offers a means to map or connect job titles back to the proper NOC code, found on the ESDC website (specifically the "Quick Search" box).⁷ For example, a "Quick Search" for "haul truck driver underground mining" shows that this occupation maps directly to "Underground mine service and support workers." The site will also show which job titles are listed for each occupation category. For example "Heavy equipment operators (except crane)" include job titles such as: apprentice heavy equipment operator; heavy-duty equipment operator; heavy equipment operator; operating engineer, heavy equipment; ripper operator – heavy equipment; shovel operator – heavy equipment; spreader operator – heavy equipment; stacker operator – heavy equipment.

NOC Code Title

0111	Financial managers
0112	Human resources managers*
0211	Engineering managers*
0711	Construction managers*
0811	Primary production managers (except agriculture)
1111	Financial auditors and accountants*
1112	Financial and investment analysts
1121	Specialists in human resources*
1241	Secretaries (except legal and medical)
1441	Administrative clerks*
1473	Production clerks
1475	Dispatchers and radio operators*
1476	Transportation route and crew schedulers*
2112	Chemists*
2113	Geologists, geochemists and geophysicists*
2115	Other professional occupations in physical sciences*
2121	Biologists and related scientists
2131	Civil engineers
2132	Mechanical engineers
2133	Electrical and electronics engineers
2134	Chemical engineers
2141	Industrial and manufacturing engineers
2142	Metallurgical and materials engineers*
2143	Mining engineers*
2144	Geological engineers
2148	Other professional engineers*
2154	Land surveyors*
2211	Chemical technologists and technicians*
2212	Geological and mineral technologists and technicians*

⁷ See <http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/Welcome.aspx>

2221	Biological technologists and technicians*
2231	Civil engineering technologists and technicians*
2232	Mechanical engineering technologists and technicians*
2233	Industrial engineering and manufacturing technologists and technicians*
2234	Construction estimators
2241	Electrical and electronics engineering technologists and technicians
2253	Drafting technologists and technicians
2254	Land survey technologists and technicians*
2255	Mapping and related technologists and technicians
2262	Engineering inspectors and regulatory officers
2263	Inspectors in public and environmental health and occupational health and safety*
6242	Cooks*
7213	Contractors and supervisors, pipefitting trades
7216	Contractors and supervisors, mechanic trades*
7251	Plumbers*
7252	Steamfitters, pipefitters and sprinkler system installers
7271	Carpenters*
7242	Industrial electricians*
7265	Welders and related machine operators*
7311	Construction millwrights and industrial mechanics (except textile)*
7312	Heavy-duty equipment mechanics*
7421	Heavy equipment operators (except crane)*
7371	Crane operators*
7372	Drillers and blasters - Surface mining, quarrying and construction*
7411	Truck drivers*
7452	Material handlers*
7611	Construction trades helpers and workers
7612	Other trades helpers and workers*
8221	Supervisors, mining and quarrying*
8231	Underground production and development miners
8411	Underground mine service and support workers
8614	Mine workers*
9211	Supervisors, mineral and metal processing*
9231	Central control and process operators, mineral and metal processing
9411	Machine operators, mineral and metal processing*
9415	Inspectors and testers, mineral and metal processing
9611	Workers in mineral and metal processing*



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