



2012

Custom Labour Market Report - Thunder Bay District Mining Industry



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Workforce Planning Board

HR
FORECASTS

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Executive Summary

This study is the outcome of a cutting edge partnership between the North Superior Workforce Planning Board (NSWPB) and Mining Industry Human Resources (MiHR) Council. The research was funded, in part, by Employment Ontario and by Human Resources and Skills Development Canada (HRSDC).

MiHR's Mining Industry Workforce Information Network (MIWIN) system is a unique labour market intelligence system that allows MiHR to produce annual forecasts of mining industry hiring requirements by occupation and province/territory of Canada under three different potential economic scenarios: contractionary (downturn in the mining industry), baseline (static or very moderate industry growth projections) and expansionary (positive growth projections). The model incorporates independent consensus forecasts of international commodity prices (suitable to the mix of commodities mined in Canada and its provinces), demographic factors such as age distribution and average age at retirement as well as productivity factors. Furthermore, MIWIN's unique system uses additional data from employer surveys and key informant interviews to incorporate added intelligence, adjusting the underlying assumptions used to generate customized forecasts.

This report presents a customized projection of mining hiring requirements for the Thunder Bay District – the first sub-provincial analysis of labour market requirements produced using the MIWIN system. In conducting this district-level analysis, MiHR used Census and Labour Force Survey data for the Thunder Bay District as a primary input into the modelling system, utilizing the Ontario-specific mining employment forecasting model. The underlying model assumptions were then adjusted based on Thunder Bay District-specific information drawn from the industry surveys and key Informant interviews conducted by MiHR as part of this study as well as from research made available by NSWPB.

The labour market challenges facing the mining industry in the Thunder Bay District are highlighted in this report. While there are similarities between the District and the Ontario and Canada-wide issues and challenges, there are three unique differences that have been built into the analysis of this sub-provincial region. These factors have contributed to an ability to identify and analyze the distinctive challenges facing the region, including:

- 1) Between 3 and 8 major mining projects are expected to come into construction and production over the short to medium term (2 to 5 years). These advanced development projects have been incorporated into the forecasting model, resulting in a significant projected increase in size of the regional mining workforce under both the baseline and the expansionary scenarios – more than 30 percent and 70 percent, respectively. In contrast, the most recent Ontario-wide forecasts (2011) show a contraction in total mining sector employment of between 8,500 and 10,000 jobs, depending on the economic outlook.
- 2) The older population profile in the Thunder Bay District, compared to Ontario has been reflected in the projections of the replacement hiring (retirement) that will be required in the coming decade. This is evident in the different profiles projected for replacement hiring requirements in the Thunder Bay District compared to the Ontario retirement profile (see yellow bars in figures 2 and 3 in the main report).
- 3) The Thunder Bay District is subject to a much higher labour mobility factor (workers who leave the district to work in other areas of the province) than Ontario as a whole. The MIWIN forecasting model assumptions were adjusted to reflect a non-retirement exit rate

(labour market churn factor) that is twice as high for Thunder Bay, compared to the whole province.

The analysis in this report shows the following key factors:

- 1) Even under a pessimistic industry growth outlook for the Thunder Bay region – where total employment in the mining sector could contract by some 20 percent – employers will still need to hire more than 1,100 workers over the next decade just to replace workers who are leaving the region or sector for other employment or who are retiring.
- 2) Under the baseline and expansionary scenarios – both deliberately conservative forecasts - the pressure to hire workers in all occupational areas increases, with hiring requirements of 2,840 and 4,150 workers respectively.
- 3) Under all three scenarios, the occupations in highest demand will include trades and production occupations such as underground miners, millwrights, minerals processors, heavy equipment operators and electricians. This is not surprising given the expected growth as advance development projects move into production.
- 4) Because of the older age structure of the Thunder Bay District, employers will also face added pressure, not only to hire people but also to replace the significant loss of skills due to the large number of experienced and highly competent job incumbents preparing to retire. These knowledgeable workers will be replaced by younger and/or less experienced workers. This factor is of particular concern in the managerial and supervisory roles, which require extensive working experience to deepen workplace instincts and develop leadership abilities.
- 5) In the Physical Sciences and technician and technologist categories, the number of workers required is less dramatic, however, employers can face particular difficulties in attracting and retain employees, largely because of they are highly mobile workers, who have adaptable skill sets and highly sought-after qualifications.
- 6) While supply-side data is not currently available for the Thunder Bay district specifically, the forecasts of available talent for Ontario as a whole are included in this report. These previously unpublished data have been included here because they can help to provide insight into the gaps that the district will face in addressing its hiring needs over the next decade. Based on the projected hiring requirements of approximately 2,840 in the baseline scenario, the Thunder Bay District will need to attract nearly 30 per cent of all new entrants to the provincial mining labour pool to meet forecasted hiring requirements. Under the expansionary scenario – with more aggressive growth projections, the Thunder Bay District needs to attract over 40 per cent of the provincial available mining talent pool.

The report concludes with a set of recommendations about the potential strategies and actions that industry, education and government could consider in developing a district-specific plan of action to address the issues identified in this sub-provincial analysis.

1. Background & Scope



Human resources challenges are one of the largest threats to the future competitiveness of the Canadian mining industry.¹ The looming retirement of the baby-boom generation, the difficulty attracting and engaging younger workers, and an under-representation of diverse groups such as Aboriginal peoples, women and new Canadians, all contribute to the human resources challenges. Further Aboriginal engagement is crucial since Aboriginal communities represent a large source of labour close to a significant number of mining operations, both within the North Superior region and across Canada. While the industry has made tremendous strides in addressing these issues, finding experienced and skilled workers is becoming more difficult, and competition across all sectors of the economy is increasing.

Through its work and research, MiHR contributes to the strength, competitiveness and sustainability of the Canadian mining industry. This report contributes to MiHR's strategic goal to support the mining industry's

ability to anticipate and plan for future labour requirements.

This report was prepared for the North Superior Workforce Planning Board (NSWPB) by the Mining Industry Human Resources Council (MiHR) and pertains to the North Superior Workforce Planning Board area which includes the geographic region of the Thunder Bay District and the communities of Webequie, Nibinamik, and Neskantaga, as shown in Figure 1.

MiHR's Labour Market Forecasting System

The forecast presented in this report is a customized development of a regional mining labour market forecast for the Thunder Bay District – the first sub-provincial analysis of labour market requirements produced using MiHR's Mining Industry Workforce Information Network (MIWIN) system.

The MIWIN system was developed to produce forecasts of employment and hiring requirements in the mining industry at the national and provincial/territorial levels.² The MIWIN forecasting model uses a variety of factors key to anticipating changes in employment in the mining and minerals exploration industry including: minerals prices, productivity factors and demographic data. The forecasts are for two-, five-, and ten-year time horizons and are presented using three economic scenarios for future mining sector employment (contractionary, baseline and expansionary), reflecting the highly volatile employment profile that characterize the mining industry in Canada.

¹ Ernst and Young, Business Risks Facing Mining and Metals, 2010.

² The development of the MIWIN system was supported, in part, by funding from the Government of Canada and with financial contributions and guidance from the mining and minerals exploration industry stakeholders across Canada.

The data inputs to the MIWIN forecasting model include Statistics Canada Census and Labour Force Survey data, supplemented and adjusted using primary research sources (region-specific analysis, mining sector employer surveys and key informant interviews). A general description of the MIWIN methodology can be found in Appendix 1 along with an explanation of the underlying assumptions used to generate the Thunder Bay District hiring requirements forecasts.

Four years in development, the MIWIN system is used to produce MiHR's annual labour market projections³ and provides the basis for MiHR's online forecasting tool, HR Forecasts⁴ described below. In addition, MiHR has been commissioned by a number of provincial organizations to produce customized labour market forecasts, reflecting the unique features of the industry and its workforce dynamics at the provincial level.⁵ These customized studies have allowed provincial planners and industry stakeholders to create tailor-made strategies to address their provinces' labour market issues and challenges.

MiHR's unique *HR Forecasts* tool allows online users to examine specific hiring requirements forecasts by selecting all of Canada or individual provinces/ territories⁶ and by selecting total employment in the industry or employment in specific occupations and/or occupational groupings. Furthermore the *HR Forecasts* online tool allows users to change some of the underlying assumptions of the MIWIN model relating to retirement rates (average age at retirement), changes in labour productivity and non-retirement separation rates (worker turnover that is not related to retirement or labour market "churn"). These "what-if" scenarios allow the user to see how the forecasted hiring requirements change when the underlying assumptions of the model are varied.

This study – *Custom Labour Market Report – Thunder Bay District Mining Industry* – is the result of a cutting-edge partnership between MiHR and the North Superior Workforce Planning Board which has produced the first sub-provincial forecast from the MIWIN system. This study is a proactive example of the type of analysis that could be conducted in other regions in Ontario and will serve to empower the North Superior Workforce Planning Board to create effective labour market and workforce planning strategies unique to the district and region. Since the NSWPB's collaborative approach is similar to that of MiHR, the strategies developed based on the forecasts in this report will engender buy-in and support from all key stakeholders – employers, workers, job seekers, education/training organizations and government.

Developing a sub-provincial forecast presents a number of unique challenges that do not exist when preparing forecasts at a provincial and national level including limited access to data from traditional LMI data sources (Statistic Canada and Labour Force Survey data), high labour mobility and an ability of workers to live outside the region while working in it (and vice-versa). As a result of these challenges, MiHR has adapted a number of assumptions in the methodology that are suitable at the provincial level for the Ontario mining labour market, adjusting them based on the outcomes of surveys, key informant interviews as well as information from NSWPB's own research and data.⁷

The forecasts presented here provide custom estimates for the region, to the best level of accuracy possible.

Industry Definition and Scope

For the purposes of its forecasts, MiHR defines the mining industry as including all phases of the mining cycle: exploration, development, extraction, processing and reclamation. The MiHR forecasts

³ http://www.mihr.ca/en/publications/resources/Employment_HiringForecasts2011_FINALAug4_ENG.pdf

⁴ See www.mininghrforecasts.ca

⁵ See Labour Market Research Publications under <http://www.mihr.ca/en/publications/MiHRPublications.asp>

⁶ Because of some data restrictions some provinces/territories have been aggregated. On-line HR Forecasts are available for the following six areas: Atlantic, Quebec, Ontario, Prairies, British Columbia and the Territories.

⁷ See http://www.nswpb.ca/census_analysis_reports

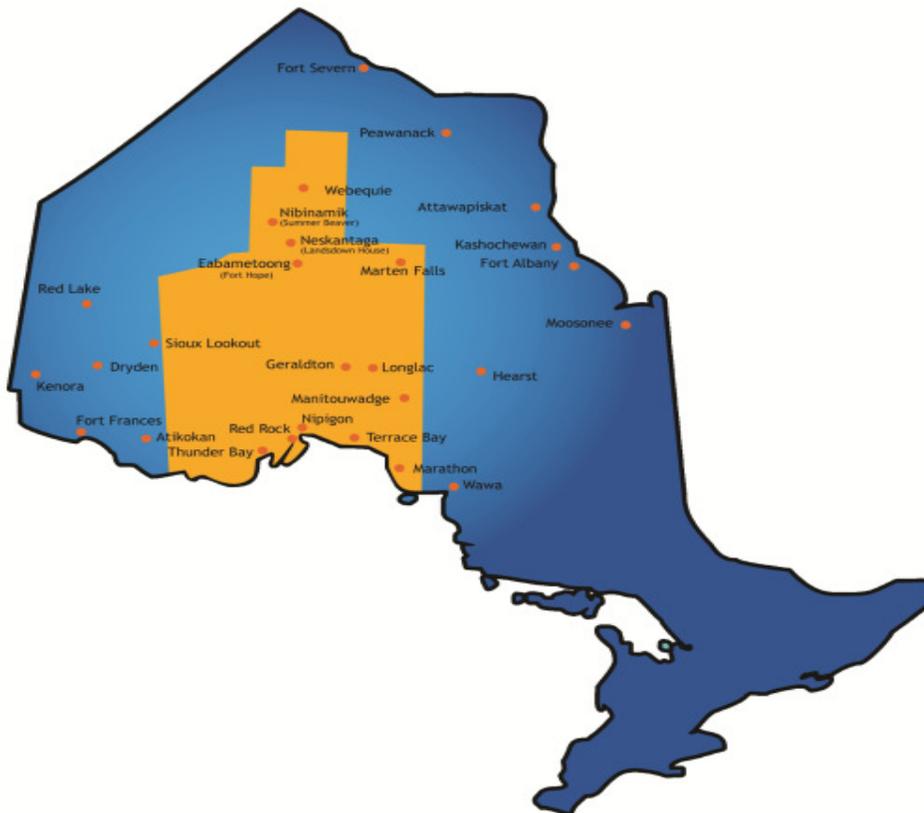
presented here include: exploration, mining and quarrying; support services and contractors (not including oil and gas); iron and steel mills and ferro-alloy manufacturing; alumina and aluminum; and other non-ferrous metal production and processing.

Forecasts presented in the report rely heavily on Statistics Canada data, among other traditional sources of data. Thus, North American Industry Classification Codes (NAICS) and National Occupational Classification for Statistics (NOC-S) codes are used to define the mining industry and determine employment levels. Findings from primary research in the industry (questionnaires and interviews) are used to verify and validate data from other sources, especially around the occupational structure of the workforce and factors such as workforce mobility, turnover and average age at retirement.

There is no single NAICS code or set of codes that directly correspond to all phases of the mining cycle. Similarly, there is no single set of NOC-S categories that pertain to mining only. People employed in occupation groups that are prevalent in mining also work in a variety of other industries.

Together, the NAICS and NOC-S systems provide a means for grouping statistics to obtain estimates of employment and workforce demographics using Statistics Canada and other public data sources. Details on the NAICS and NOC-S codes included in the forecasts are found in Appendix B.

Figure 1
Thunder Bay District



Source: North Superior Workforce Planning Board

2. Regional Economic Overview

The end of the recession and the subsequent recovery in commodity prices returned Canada to economic growth in 2011. Demand for commodities has resumed from developing countries and will slowly strengthen as the United States and European economies digest and address the fiscal and labour market challenges caused by the recession and labour market demographics. The return of global growth has been important to the economic outlook of the Thunder Bay District. Greater demand for commodities from trading partners around the world and the discovery and development of the mineral resources in the “Ring of Fire” in Northern Ontario will increase the importance of the mining sector to the region.

However, market volatility and economic uncertainty continues despite the evidence of recovery. The global economy continues to rebalance after the recession and inflationary pressures could suppress demand for commodities in emerging markets. In addition, the mining sector is highly sensitive to sudden shifts in global demand. The global recession recently illustrated this sensitivity—sudden volatile shifts in the demand for commodities results in significant changes in prices, leading to reduced mining activity and ultimately reduced employment.

This volatility complicates the forecasting of commodity prices and demand going forward. In the short-term, tight supply conditions, coupled with growing global demand, are expected to lead to a modest increase in minerals and metals prices and subsequently production.⁸ However, over the medium and longer-term, prices are expected to moderate as global metals production increases and some anticipated deceleration in demand from emerging markets occurs.⁹ In addition, development potential in the Ring of Fire region will place unique pressures on the mining labour market in the Thunder Bay District over the forecast horizon.

Regional Labour Market Context

In order to better understand the variables at play in the Thunder Bay District labour market and given the data constraints and estimation exercises necessary for this project, MiHR reached out to industry stakeholders in a survey on labour market needs and interviewed fifteen key informants associated with the mining industry in the region.¹⁰ These methods offered insights and perspectives on the region’s mining labour market from government, extraction, exploration and development, support, and service sections of the labour market. Inputs were then used to validate and adjust the assumptions used in the modelling exercise. Key informants raised six key challenges facing mining in the region.

■ Tight Labour Market

Though they came from diverse fields, all of the stakeholders surveyed indicated that the mining labour market in the region was tight in general and exceptionally so for positions that required advanced training, trades certification and/or significant education. There is a very high demand for workers in the region, but there are not enough workers, or enough workers with the necessary skills or qualifications to fill all of the current demands.

⁸ Bank of Canada, April 2011 Monetary Policy Report

⁹ Bank of Canada, April 2011 Monetary Policy Report, Ibid.

¹⁰ Fifty-four surveys were sent to Thunder Bay District employers in late 2011 and the response rate was 12 percent. This data was supplemented with fifteen more extensive Key Informant Interviews (KIIs) conducted by MiHR’s research personnel by telephone. The KII participants were selected by MiHR in consultation with the NSWPB as being likely to provide enhanced knowledge about mining industry developments and HR challenges in the region. Finally, MiHR made use of the extensive research available through the North Superior Workforce Planning Board in developing the forecasts of hiring requirements.

- **Worker Demand to Outstrip Supply**

As exploration and development activities continue in the Ring of Fire, stakeholders expressed expectations that the labour market in the region will remain very competitive and demand for workers will continue to outstrip supply into the future. In a couple of cases, participants indicated that their operations were already unable to fill all of the positions currently available because of a lack of qualified labour.

- **Projected Mining Growth**

Over the next ten years, most stakeholders believed that two to five new mines would likely open in the region over the next five years and that five to eight of the more than 300 exploration and development projects currently underway might move into operation before the decade's end. According to the key informants, the vast majority of the companies pursuing these projects are based outside of the region. Significant pressures will continue to be felt as advanced development activities move into the construction and production stages of the mining cycle.

- **Highly Mobile Labour Force**

One key issue flagged by participants was the high degree of labour mobility in the region. The large amount of mining activity taking place in Northern Ontario, Canada and the world, forces many companies to compete nationally and globally, not just regionally for their labour. The key informants uniformly cited engineers, skilled trades and experienced drillers as positions where the mobility and non-retirement separation of workers were highest. Despite the global nature of these labour market pressures facing the region, most of the individuals surveyed said that when people have departed their organizations to work outside the Thunder Bay District, they have largely moved to Southern Ontario or found opportunities in other parts of Canada.

- **Aging Workforce**

Most survey participants highlighted the challenge presented by the aging of the labour force and the need to prepare for the looming retirement of the Baby-Boom generation, especially in currently existing operations. Participants noted that their organizations had put in place different procedures or approaches to moderate the impact of an aging workforce, including using job sharing between older and younger workers, mentorship programs and working to keep recently retired workers engaged in the company, often as part-time consultants.

- **Employing Aboriginal Peoples and Other Diverse Groups**

In addition to those activities, employers noted that their organizations were focused on efforts to engage and employ members of the local Aboriginal communities. Employer experiences differed on the level of success their organizations had in attracting a steady stream of Aboriginal talent, with some seeing no success while others experience significant success. The most frequently cited challenge in employing Aboriginal peoples was the skills gap between what individuals often possessed and what was required to become employed in the mining sector. For some participants this gap was something their organizations sought to eliminate through internal training and development programs, however for other key informants, particularly those in smaller organizations in exploration and support services, internal training was beyond the means of their organization and they hoped for external support in providing training, either from government or from the education system.



3. Hiring Requirements Forecasts

Thunder Bay District Hiring Requirements

MiHR's research has shown that employment in the mining sector is more volatile than in many other industries in Canada.¹¹ Previous labour market forecasts produced by MiHR show that despite this volatility, future hiring requirements will be quite significant across Canada, even under contractionary (i.e., poor economic outlook) scenarios. MIWIN's 2011 projections for Canada as a whole show hiring requirements forecasts ranging from 75,000 – 140,000 workers over the next decade. Even with a very moderate outlook, MIWIN's baseline scenario for the Canadian Mining Industry predicts the need to hire approximately 112,000 workers over the next ten years.

These same trends are evident in the labour market forecast for the Thunder Bay District; even under a contractionary scenario - where total employment in the mining sector decreases by approximately 20 per cent – slightly more than 1,000 workers will need to be hired to offset the workforce attrition that is simply due to retirements and other separation.

Cumulative Hiring Requirements Forecast

Table 1 shows forecasted hiring requirements for the Thunder Bay District mining industry for three scenarios—baseline, contractionary and expansionary (details on scenario development and assumptions can be found in Appendix A).

Estimates of total employment in the sector can be calculated by adding the “change in employment” – column 2 - over the forecast period to total employment in the forecast year (2011). Mining sector employment for the Thunder Bay District was estimated at just over 2,125 workers in 2011. Thus in the baseline scenario, total employment by 2022 is forecasted to be 2,785 – an increase of over 30 per cent. The contractionary scenario shows the size of the total mining workforce in the region decreasing by some 20 percent, while hiring requirements remain positive and significant – more than 1,000 workers required to replace those who leave the region's mining workforce for other regions or other sectors or because they retire. Under the expansionary scenario, total employment in the Thunder Bay district's mining industry increases by over 70 per cent to almost 3,700 employees.

In all three cases, demand for workers will be significant, as shown in Table 1. Under the baseline scenario, the projected cumulative hiring requirements over the next 10 years will be approximately 2,840 workers; 1,110 workers in a contractionary scenario; and 4,150 workers in an expansionary scenario.

Table 1

Cumulative Hiring Requirements Forecast—Thunder Bay District
By Scenario—2022

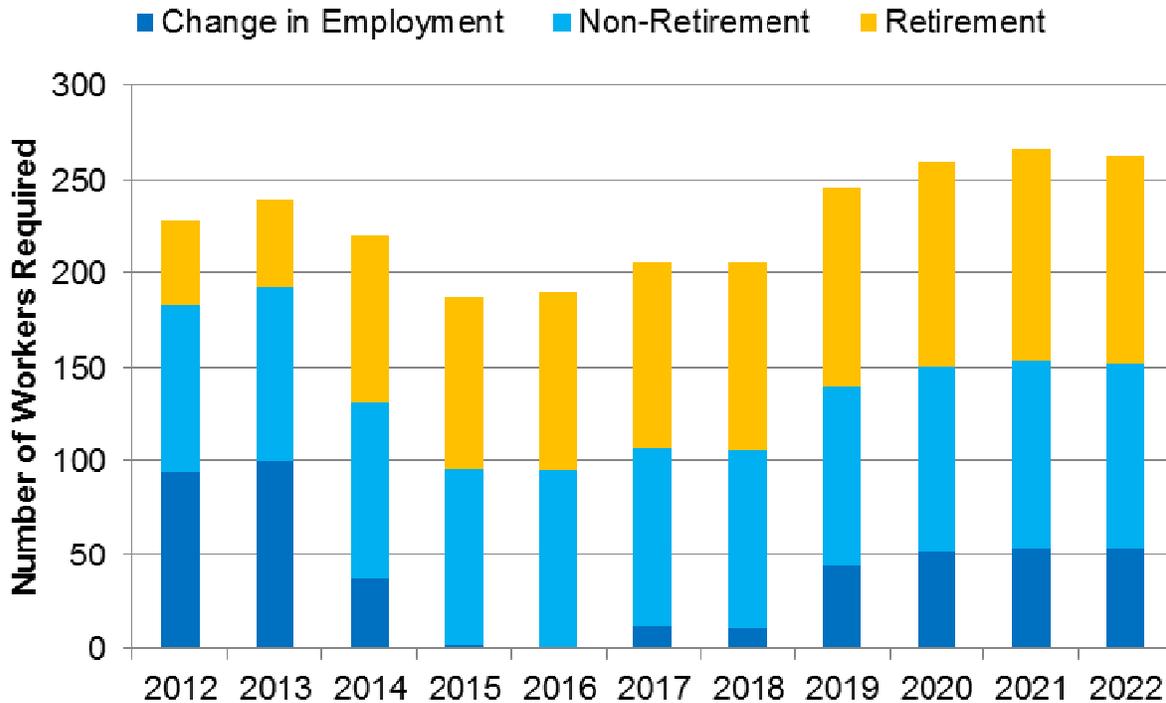
	Change in Employment	Replacement Requirements		Cumulative Hiring Requirements
		Retirement	Non-Retirement Separation	
Contractionary	-410	720	800	1,110
Baseline	660	1,050	1,135	2,840
Expansionary	1,540	1,270	1,270	4,150

Source: Mining Industry Human Resources Council, January 2012 Note: Estimates do not add perfectly due to rounding.

¹¹ Canadian Mining Industry Employment and Hiring Forecasts: A MIWIN Report, 2011.
http://www.mihrc.ca/en/publications/resources/Employment_HiringForecasts2011_FINALAug4_ENG.pdf

Figure 2 shows the hiring requirements for the Thunder Bay District on a year-over-year basis, for the baseline scenario.

Figure 2
Annual Hiring Requirements Forecasts – Thunder Bay District
Baseline Scenario – 2012 to 2022

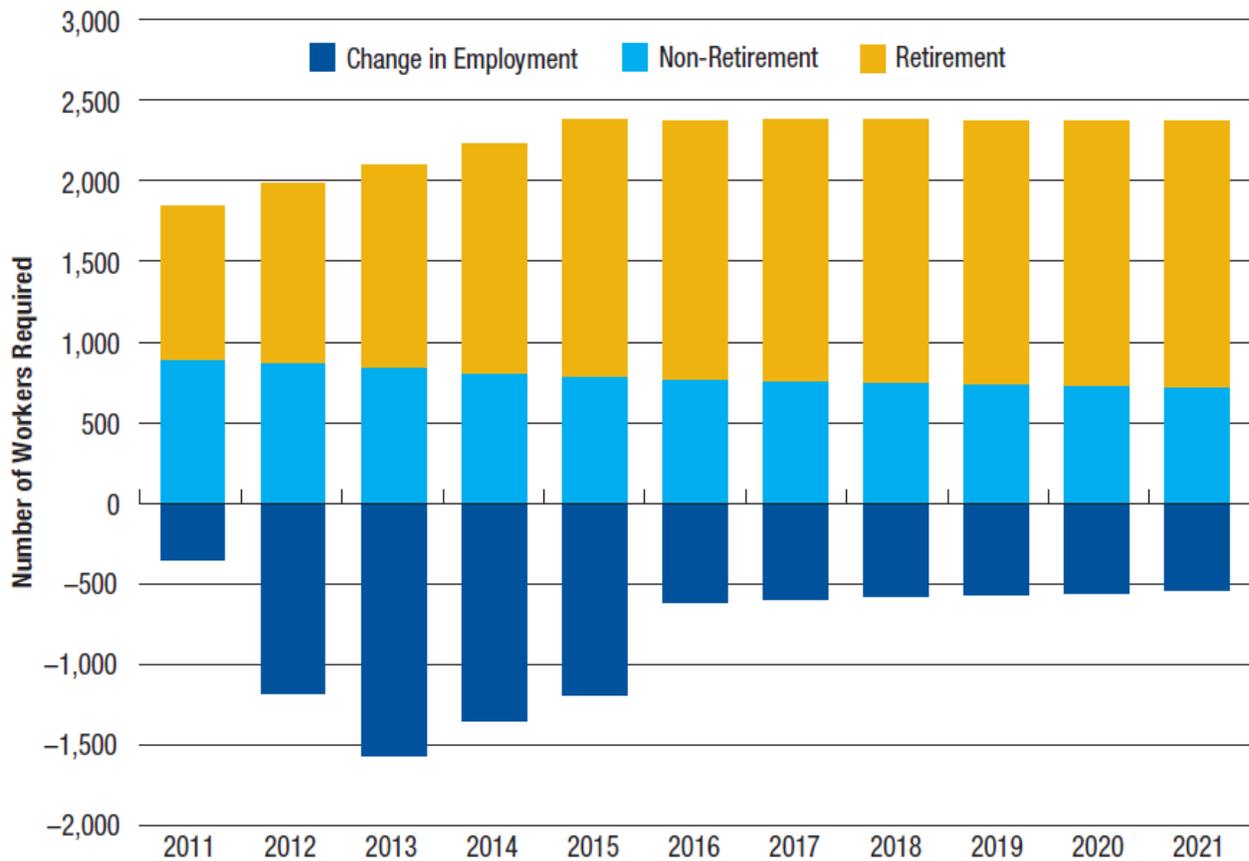


According to the MIWIN forecasts for the Thunder Bay District, the mining industry will need to hire between 200 and 250 workers each year, under a baseline scenario because of new mine development, retirement and other replacement demands.

As shown in Figure 3, the results for the Thunder Bay District varies significantly from MIWIN's forecasts for the Ontario mining industry as a whole, where the cumulative hiring requirements of approximately 16,000 workers are driven by replacement demand alone, rather than from industry expansion.¹² In fact, the MIWIN system shows an overall decrease in total employment in the Ontario mining industry of approximately 20 percent.

¹² See Canadian Mining Industry Employment and Hiring Forecasts: A MIWIN Report, 2011, *ibid* p. 21

Figure 3
Annual Hiring Requirements Forecasts – Ontario
Baseline Scenario – 2011 to 2021



Source: Mining Industry Human Resources Council, Summer 2011.

Table 2 summarizes the cumulative hiring requirements for the Thunder Bay District in 2014, 2017 and 2022, under MiHR’s contractionary, baseline and expansionary scenarios.

Table 2
Cumulative Hiring Requirements Forecast—Thunder Bay District
By Scenario—2014, 2017, 2022

	Cumulative Hiring Requirements		
	2014	2017	2022
Contractionary	180	475	1,110
Baseline	690	1,270	2,840
Expansionary	920	1,995	4,150

Source: Mining Industry Human Resources Council, January 2012. Estimates may not add perfectly due to rounding.

Hiring Requirements Forecast By Occupation

Occupational coefficients represent the proportions of each occupation that are present in the mining labour force. Coefficients are developed from census data and confirmed by MiHR surveys of operating mines in Canada. They are used to break down the forecasted hiring requirements into needs for specific occupations (based on NOC-S codes that are essential and/or typical of the mining workforce). They can also be used to draw some conclusions about the occupations in highest demand, both within the mining sector and from other sectors which may compete with mining for similar skills sets.

The occupational hiring requirements are presented in Table 3 by broad occupational category. Occupational hiring requirements are based on the current occupational structure of the mining sector and may over- or under-estimate needs for each occupation as new mines come online and the occupation structure of the mining workforce shifts over time. These potential shifts would be caused by such things as moving from the construction phase of mine development into the production phases. These estimates are presented to provide an indication of needs in particular occupational groupings. The numbers presented in Table 3 below provide indicators of needs in the region for training and other support for particular occupational groups.

MiHR includes 66 key occupations in its occupation-level analysis of forecasts. These occupations represent just over 70 per cent of all employees in the mining sector and are carefully selected to represent a broad spectrum of jobs that are considered unique or essential to the industry. Occupations listed in the “other” category are considered non-specific to mining and jobs that are commonly found in other sectors (e.g., cleaning and janitorial positions, non-specific administrative roles, accountants and business analysts, nurses and other roles).

Table 3

Cumulative Hiring Requirements Forecast by Occupational Category¹³--Thunder Bay District, by Scenario, 2022

	Cumulative Hiring Requirements (2022)		
	Contractionary	Baseline	Expansionary
Trades and Labour Occupations	475	1,240	1,805
Supervisors, Coordinators, and Foreman	90	215	320
Professional and Physical Science Occupations	55	150	215
Support Workers	45	130	185
Technical Occupations	35	105	140
Human Resources and Financial Occupations	25	55	90
All Other Occupations	385	945	1,395
Total	1,110	2,840	4,150

Source: Mining Industry Human Resources Council, January 2012

Table 4 shows the top five specific occupations within each of the occupational groups reported above as an indication of those occupations with the highest demand. The numbers shown are for the baseline scenario. Estimates for these figures under the expansionary and contractionary scenarios are also found in Appendix B.

¹³ An occupation-specific breakdown of the needs within each category is possible. These are presented in Appendix B, but should be interpreted with caution, given the smaller region-specific data set. Occupational needs will adjust over the forecast period and be mainly driven by the specific context of the mining operations that develop in the region. All occupation-specific data has been rounded to the nearest 5 workers.

Table 4

Cumulative Hiring Requirements Forecast -- Thunder Bay District - Top Five Occupations per Occupational Category, Baseline Scenario, 2022

Trades and Undesignated Occupations	Cumulative Hiring Requirements
Underground production and development miners	235
Labourers in mineral and metal processing	160
Construction millwrights and industrial mechanics (except textile)	150
Heavy equipment operators (except crane)	105
Industrial electricians	85
Professional and Physical Science Occupations	
Geologists, geochemists and geophysicists	40
Mining engineers	30
Industrial and manufacturing engineers	20
Metallurgical and materials engineers	15
Mechanical engineers	15
Human Resources and Financial Occupations	
Financial auditors and accountants	25
Human resources managers	10
Financial managers	10
Specialists in human resources	<5
Financial and investment analysts	<5
Support workers	
Inspectors and testers, mineral and metal processing	65
Dispatchers and radio operators	20
Secretaries (except legal and medical)	15
Transportation route and crew schedulers	15
Administrative clerks	10
Technical Occupations	
Geological and mineral technologists and technicians	40
Chemical technologists and technicians	20
Industrial engineering and manufacturing technologists and technicians	15
Electrical and electronics engineering technologists and technicians	10
Mechanical engineering technologists and technicians	10
Supervisors, Coordinators, and Foremen	
Supervisors, mineral and metal processing	85
Supervisors, mining and quarrying	70
Primary production managers (except agriculture)	35
Contractors and supervisors, pipefitting trades	15
Engineering managers	10

Notable Trends and Potential HR Issues

Based on the forecasts presented above, there are a number of trends and potential HR issues facing the mining industry in the Thunder Bay District. These include:

- The greatest hiring requirements, in terms of numbers, facing the region on an occupation basis are in the “*trades and undesignated occupations*”. This is consistent with what MiHR has found across the country. The production and extraction phases of mining are labour intensive and with several new mines expected to come online, these positions will be difficult to fill and workers in these roles will become more mobile. Furthermore, skilled workers such as Tradespeople (Millwrights and Electricians), Heavy Equipment Operators and Truck Drivers, who are amongst the specific occupations with the highest demand¹⁴, hold highly transferable skills. This means they are also sought after by other industries, so mining sector will face stiff competition for workers with these skills sets. This pressure can be expected to be even higher for the Thunder Bay district, given the existing strong “pull” factors from other regions of the province as well as from the other parts of Canada. Finally, MiHR’s latest national employer survey conducted in 2010 revealed that the average turnover rate in the Trades and Undesignated Occupations category is twice as high as in all other mining occupations (8 per cent, compared to 4 per cent in other occupations).
- The category facing the second greatest hiring requirements is the “*supervisors, coordinators, and foremen*” category. Given the outlook for the region and mix of activities being undertaken, with many new mines projected to begin operations over the forecast period, this need is not surprising. As new mines move into the labour intensive activities of production, the need for line managers and supervisors will reflect the hiring needs observed in the trades and undesignated occupations category. These supervisory roles are normally occupied by employees who have significant experience in the industry and the fact a majority of these workers are eligible to retire over the next decade underscores a key replacement challenge - the need to attract and retain new employees now so that they have the opportunity to build their depth of experience in order to develop the specific competencies required to assume these supervisory roles.
- Though some occupational categories have lower hiring requirements than others, not all hiring needs are equal in relation the degree of difficulty in recruitment. “*Professional and physical science*” and “*technician and technology*” occupations require workers who are both educated and experienced. These roles, while perhaps not as great in number, can prove difficult to fill, largely because the qualified talent are highly mobile, have higher levels of formal education and adaptable skill sets. This makes attracting and retaining them difficult and resource intensive.

¹⁴ See Table in Appendix B.

- The demographics and aging of the workforce indicate that the industry in the Thunder Bay District will be losing a large number of their experienced workers. The average age of retirement in mature operations in the region is 59.5 years, well below the national average for the labour force at 62 years. This could pose a significant challenge as their replacements may lack the experience and workplace intuition that comes with many years' experience on the job.
- It is worth noting that the age demographics of the exploration workforce are somewhat different than the extraction workforce. Workers in exploration, particularly in geoscience and technician roles, tend to retire slightly older at 62 years. However, there is evidence that this segment of the mining workforce lacks workers in the mid-career age categories (35-45 years). With the significant level of exploration activity in the region, this trend may add further pressure to the future needs for hiring experienced geoscientists and geological technicians to fill vacant positions.
- Aboriginal peoples are an important source of talent for the district. Many employers in the region have proactive strategies to engage and develop the potential that exists in local Aboriginal communities. Stakeholders indicated that local communities are well informed and cautiously optimistic about future employment opportunities. That said, the need for employment in many local communities is immediate, yet many advanced development projects are still several years from entering production stages. Assisting and supporting local communities through the intervening years and proactively providing training activities for future employment were cited as positive steps in keeping local communities interested in the opportunities to come.
- Across Canada, there is a trend towards under-utilizing Aboriginal talent. In mining, Aboriginal peoples are mainly employed in labour and support roles. Industry and education partnerships to provide advanced education opportunities for local Aboriginal communities has potential to ease the pressures that district employers will feel in sourcing critical talent for physical and engineering science and technician roles.
- Immigration will continue to be another key source of talent for the district. Mining is a global industry and many skilled workers are already coming to Canada to find opportunities. However, new Canadians tend to settle in large urban centres. Survey responses indicated that employment of new Canadians in mining in the district is slightly below the national average for mining at 7 per cent compared to 8.7 per cent. Employers in the district may find positive results in strategies to attract immigrant talent from large cities.
- Women are broadly under-represented in Canadian mining (14 per cent compared to 47 per cent in the national labour force). Further, the women employed in the industry mainly occupy administrative and clerical roles. Survey results indicated that women are under-represented in mining in the district. While not a census estimate, survey results indicated that women represented on average 11 per cent of the workforce for district employers (with a range of 5 to 20 per cent). Efforts to remove potential barriers and ensure opportunities for women in the industry will be key in filling future hiring requirements in the district.



4. Available Talent Forecasts

A natural reaction to MiHR's hiring requirements forecasts is a desire to know more about the potential sources of talent to meet the projected needs. MiHR has recently developed new forecasting capabilities to project total available talent for the same 66 key mining occupations included in its hiring requirements forecasts. At the present time, these talent projections have been developed at the provincial level in Saskatchewan and Ontario only and this report is the *first* publication of the estimates for Ontario. While MiHR is not yet able to disaggregate these forecasts to a regional level, the provincial-level projections can provide an indicator of the needs of the region, assuming that the district will attract a portion of the talent available to the province as a whole. The numbers presented here are intended to provide insights into the gaps that the district will face in addressing its hiring needs over the next decade. They also help to inform the recommendations at the end of this section regarding ways to increase the regions share of available talent as well as potential strategies to grow the talent pool.

Forecasting Talent Availability for the Province of Ontario

The talent availability forecasts presented here use a stock and flow model for specific occupations. This approach is best illustrated using a bathtub analogy, in which the water in the bathtub represents total supply; water coming from the spout represents "new entrants" and water going out the drain represents "leavers" or people exiting the labour force. The model adjusts the labour force each year for each occupation across all industries, by starting with the existing labour force, adding new entrants, and subtracting people who leave the labour force.

The main sources of new entrants include school leavers (i.e., individuals leaving school to join the labour force); individuals coming to Ontario from other countries (immigration) and other provinces (inter-provincial migration); and others such as people re-entering the labour force after a temporary absence (e.g., after a parental leave). Sources of labour market exits include emigration to other provinces or countries, retirement, changes in occupation, and disability or death.

Available Talent for Ontario Mining

The results of the forecast provide estimates of labour supply for all industry sectors over a 10-year horizon. Although a number of the occupations included in the data set are specific to mining, many are not, thus total supply of talent was forecast by occupation across all industries. This allows for assessment of the potential pool of workers in the province from which the mining industry can draw. Estimates are also provided of the number of workers in each occupation that are historically attracted to employment in the mining industry. This allows for an assessment of the relative tightness of the mining labour market for each occupation.

Annual supply of workers across all 66 occupations, in all industries, was forecasted and the mining industry's share of the talent pool was estimated based on historic trends of the flow of workers into the mining industry.

New entrants from migration trends, school leavers and re-entry into the labour market represent a reasonable estimate of available talent to meet the future hiring requirements for each occupation. This model assumes relative equilibrium in current supply and assumes that those already employed or seeking employment will remain in the province (not necessarily with the same employer) or be captured as exiting the labour pool in "exit" estimates. Using this stock and flow model, new entrants represent the pool of available talent to fill hiring needs over the forecast horizon.

Table 4 shows the availability of talent over a two-, five-, and ten-year horizon for the province of Ontario. According to model projections, there will be approximately 457,080 new entrants into Ontario’s labour force for the selected 66 occupations. Historically, the mining industry in Ontario has attracted 2.2 per cent of new entrants. Assuming this rate remains constant moving forward, Ontario’s mining industry can expect to attract 10,020 new entrants over the next 10-years.

The proportion of new entrants to the labour market that the mining industry attracts varies among the occupations, depending on how specific each occupation is to the mining industry. For example, the mining industry typically attracts about 2 per cent of HR specialists in Ontario’s labour pool, but logically it attracts 96 per cent of underground miners.

Given the projected hiring requirements of the Thunder Bay District mining industry of approximately 2,840 in the baseline scenario, it should be noted that the Thunder Bay District will need to attract nearly 30 per cent of the new entrants to the mining labour pool in Ontario to meet forecasted hiring requirements. Under the expansionary scenario – with more aggressive growth projections for the industry - the Thunder Bay District needs to attract over 40 per cent of the provincial available mining talent pool. This gap points to a significant challenge in filling the labour market requirements of the regional mining industry.

Table 4
Cumulative Available Talent, Ontario, All Sectors and Mining
66 Occupations—2014, 2017, 2022

	2014	2017	2022
Total entrants for 66 occupations, all industry sectors	137,560	274,895	457,080
Mining’s share of entrants for 66 occupations (assuming the historic rate of 2.2 per cent)	3,015	6,025	10,020

Source: Mining Industry Human Resources Council, January 2012.

Increasing Mining’s Share of Available Talent

Just as the nature of talent gaps differs among occupations, so do the strategies to address the gaps. The responsibility to develop and implement these strategies rests, not only with industry employers, but also with education and governments. Working together to support the mining industry’s ability to attract talent will benefit Ontario’s economy as a whole, by enabling a key economic sector to progress. In some cases, industry, education and government must aim to attract more entrants from an existing pool (e.g., carve out a larger slice of the talent pie). This is not an easy undertaking, though. As mining competes for more of its traditional share of the talent pool, other industries respond with attempts to maintain their share and the competition for talent increases.

As the competition for talent heats up other complications arise. For example, workers become more mobile and look for options in other sectors, or other regions. In some cases, employers feel driven to offer higher salaries and increased benefits in efforts to retain talent. These strategies may result in short-term gains, but quickly become unsustainable.

To address these sorts of gaps the employers, education and government can:

- Work together to promote careers in mining to youth, workers in other provinces, and new immigrants.
- Support career awareness and outreach activities of various associations, like the North Superior Workforce Planning Board.
- Adopt a consistent industry brand that promotes positive impressions of careers in mining and dispels myths. MiHR's *Explore for More* brand can be readily adapted to provincial and regional needs.
- Coordinate and expand initiatives to engage, educate, train, and provide employment opportunities for under-represented and under-utilized segments of the labour force, such as women, new Canadians, and local Aboriginal communities. Some examples to consider might include:
 - Supporting workplace skills development and occupation-specific training in exchange for commitments to work for in the mining industry or the sponsoring employer upon graduation
 - Providing incentives to target groups to pursue relevant education (skilled trades, technical training, professional training, supervisory courses) through partial or full reimbursement of educational expenses upon successful program completion and hiring on with a mining industry employer.
 - Creating and supporting partnerships between training organizations and regional mining sector employers to deliver programs like *Mining Essentials: A work readiness training program for Aboriginal People*. This pre-employment training program, developed jointly by MiHR and the Assembly of First Nations, is based on the essential skills and other work-readiness requirements of the mining industry. The delivery approach has been custom-designed to ensure that Aboriginal participants are able to achieve all of the required learning outcomes, making them highly employable in entry-level positions.
- Create a community of practice to share experiences, initiatives, and practices and create synergies amongst regional employers in attracting new talent. For example, collaborative and cooperative hiring campaigns and career fairs could be held within Ontario or, indeed in other provinces, making the regional opportunities for employment known to skilled workers outside the region.

Growing the Talent Pool

In other cases, there simply aren't enough people in the talent pool to meet the industry's needs. The industry and its counterparts in education and government must strive to increase the number of entrants and grow the talent pool (i.e., make the pie bigger). These solutions are generally long term and require coordinated and streamlined efforts amongst employers, government, education, and industry associations. Targeted efforts to re-attract retirees and retain mature workers have proven to be good mitigation strategies where talent, and particularly depth of experience, is simply not yet available. These efforts ensure that an already small labour pool does not shrink further and that experienced workers remain in the workforce to mentor younger workers and rapidly increase their future potential in the workforce.

Possible approaches to growing a talent pool include:

- Government, employers and education could explore ways to increase flexibility in apprenticeship and skills training programs to develop new workers faster, without compromising quality of training.
- Enhance the participation and collaboration by all stakeholders, especially employer representatives, in local education task forces, planning boards, and committees.
- Coordinate industry efforts with local educational institutions to provide work experience programs and encourage graduates to remain in the local area.
- Support participation in MiHR's Canadian Mining Certification Program (CMCP), which provides a nationally-recognized credential to experienced workers in previously unrecognized mining-specific occupations such as Underground Miner, Minerals Processing Operators, Surface Miners and Diamond Drillers/Diamond Driller Assistants. Professionalization of these occupations will contribute significantly to attracting youth and second career seekers to mining as an employment sector of choice.
- Formalize linkages between MTCU's Common Core programs for mining occupations and MiHR's CMCP, ensuring mutual recognition between the programs and connecting them directly to employment within the region's mining industry.
- Develop a communication strategy to public and separate schools to promote the mining sector as an employer of choice, working with key educators (principles, guidance counsellors, teachers) to integrate mining curriculum and programming and expanding upon the work of PDAC's *Mining Matters*.
- Support and strengthen efforts to facilitate communication between employers, in expressing needs, and education institutions, in working to address those needs. It can take years to mobilize the necessary resources and institute new training programs to graduate competent new entrants to the labour market. Employer needs are usually more immediate than what education institutions can adjust for. Longer planning horizons for employers and the close channels of communication with education institutions can help to reduce this gap.
- Invest in pre-employment and in-house training programs to ensure equal opportunities for all communities of interest and smooth transitions from training to employment.

Appendix A

This appendix outlines the methodology¹⁵ used by the MIWIN system to produce forecasts of hiring requirements in the mining industry at the national and provincial levels. A flowchart depicting this methodology is provided in Figure A1. It also describes the model specification and various data that was used in developing the Thunder Bay District forecasts. As noted previously in the report, MiHR used the Ontario provincial forecasting model and employed region-specific data from the Thunder Bay District to adjust the underlying assumptions in the model to produce the regional hiring requirements forecast.

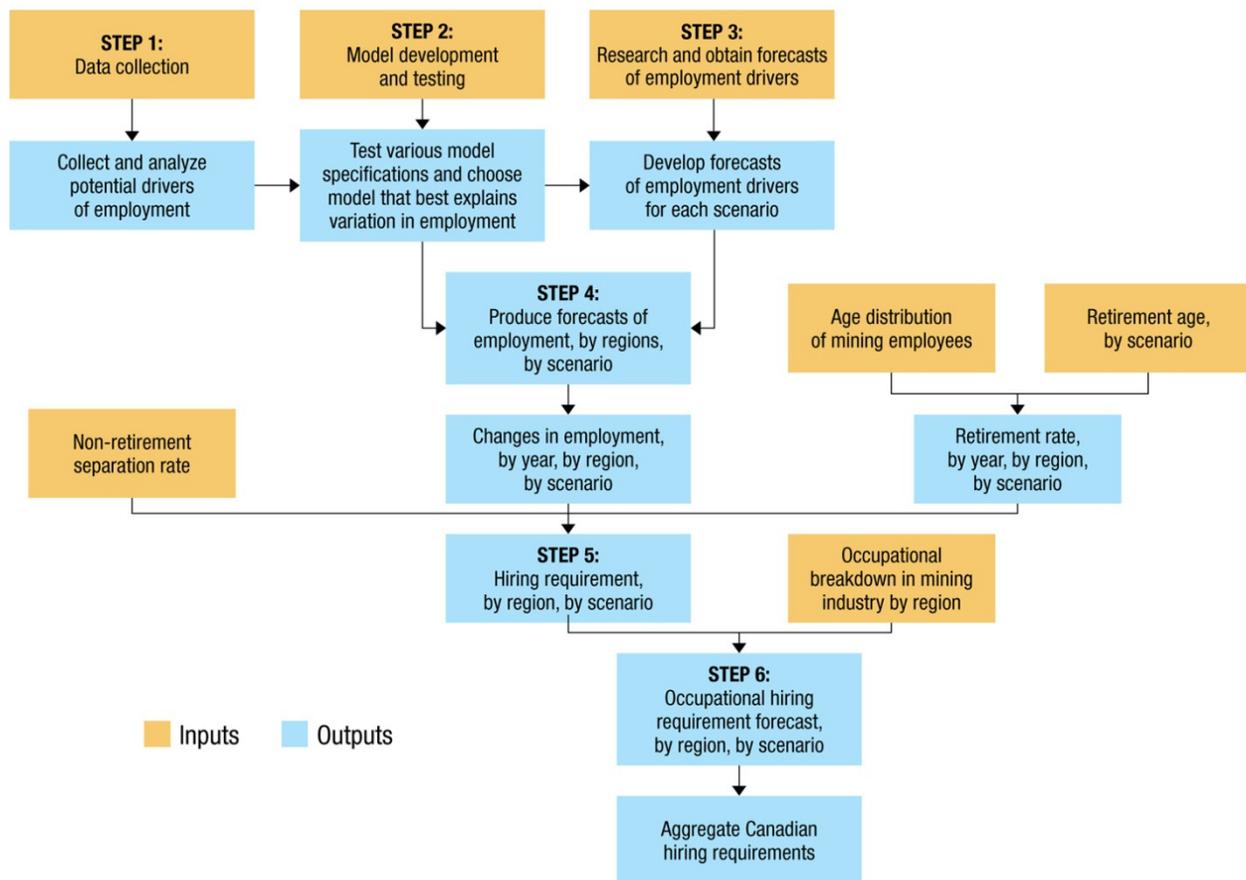
Models of employment were estimated based on the following six steps:

- Step 1: Collect and analyze Statistics Canada, Labour Force Survey and other secondary data on commodity prices, labour productivity and population demographics that may potentially explain changes in the number of jobs in the region.
- Step 2: Determine the driver(s) that explain the greatest level of variation in the number of jobs 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.
- Step 7: For the Thunder Bay District, the provincial-level forecast prepared in the previous steps is adjusted, based on data inputs for the district including anticipated major projects expected to go into production, difference in the age structure of the population and a higher level of labour mobility.

¹⁵ The methodology described within this Appendix is exclusive property of the Mining Industry Human Resources Council
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Figure A1
Employment and Hiring Requirements Forecasting Model



Source: Mining Industry Human Resources Council, January 2012

In Ontario, several indicators were considered strong explanatory variables for predicting employment. The Ontario MIWIN model uses commodity prices, in conjunction with labour productivity and previous year’s employment, as key variables to predict changes in employment in mining. There is a positive relationship between commodity prices and employment, and a negative correlation between labour productivity and employment. The following section provides more detail about the sources these explanatory variables and describes the adjustment process used to account for differences between the province and the Thunder Bay District.

Forecast Methodology

MiHR’s forecasts are based on an economic model that combines a number of factors including labour productivity, changes in commodity prices, retirement rates and non-retirement separation rates. Using a combination of independent economic forecasts and information from industry stakeholders, the model translates these factors into forecasts of mining employment and hiring requirements over a 10-year period.

The Thunder Bay District hiring requirements forecasts are the result of proportioning out the hiring requirements forecast from MiHR’s provincial model for Ontario and injecting region specific intelligence from other data sources. The provincial model was customized using data

from Statistics Canada's 2006 census, Labour Force Survey, data collected by the NSWPB, and triangulated with data from key informant interviews and a survey of industry employers.¹⁶

MiHR's forecasts are based on an economic model that combines a number of factors including, labour productivity, changes in commodity prices, retirement rates and non-retirement separation rates. Using a combination of independent economic forecasts and information from industry stakeholders, the model translates these factors into forecasts of mining employment and hiring requirements over a 10-year period.

Labour Productivity

Labour productivity is influenced by a number of different factors and trends that affect the level of a sector's output over time—for example, technology advancements and training can increase a worker's productivity. On the whole, labour productivity has an inverse relationship with the overall level of employment. As productivity grows, the sector is able to “do more with less,” which means that higher levels of productivity tend to be associated with contractions in employment needs. In the model, the Thunder Bay District's mining labour productivity is assumed to be identical to that forecast for the Ontario mining industry as a whole.

Minerals and Metals Price Index

Mining employment in Canada tends to be more volatile than in many other sectors, making long-term workforce planning more challenging. In large part, the volatility of mining employment is a result of reactionary workforce adjustments due to the large and sometimes unpredictable fluctuations in the prices and demand for mining commodities. MiHR research demonstrates a strong positive correlation between movements in commodity prices and the overall level of mining employment in Canada.

As a result, the model includes a consensus minerals and metals price index forecast for the forecast period which was custom-designed for use in the MIWIN system. Authorities contributing to this consensus include, among others, the World Bank, Bank of Canada, private sector Canadian banks and commodity-specific economic analysis consultancies.

¹⁶ The survey had a response rate of 12 per cent; including all support service providers. However when isolating responses from major employers and key advanced development projects, the survey had a response rate of just over 60 per cent and was a reasonably representative sample.

Retirement Rate

Over the next decade, the entire Canadian labour force is facing a looming wave of retirements, as members of the baby-boom generation become eligible to leave the workforce. However, it is difficult to predict the timing of retirements. The decision to retire is a complex one and each individual considers a number of factors such as financial goals, levels of debt and savings, family circumstances, health status, retirement policies and other labour market pressures. The complex nature of individual retirement decisions is an important factor when developing predictions for future retirement rates.

MiHR uses a conservative approach when estimating retirement rates. Historical retirement ages are considered and a profile of expected retirement is created based on the age demographics of the region. For this forecast the demographics for the province of Ontario are used as a basis for the district age demographics, but these were adjusted, taking into account NSWPB research¹⁷.

Non-Retirement Separation Rate

The non-retirement separation rate captures important movement and churn in the labour market that are not directly related to a change in the overall level of employment. This variable includes, for example, individuals leaving the mining industry in the Thunder Bay District for another industry sector or for the mining industry in another region, as well as people leaving the labour force for other non-retirement reasons such as death or disability, or to return to school.

A challenge inherent to producing a forecast on the district level is that the relatively small geographic area of a regional level analysis of the labour market dictates that workers' mobility should be considered. Workers are exceptionally mobile within a region, as compared to the provincial and national levels of analysis. They are able to live in an outside region while working in the Thunder Bay District, or easily travel from the Thunder Bay District to other regions to work.



This makes developing a non-retirement separation rate for the region difficult and poses challenges around how workers should be counted. Should workers be counted based upon where they contribute to the economy through spending and living or, through where they work and contribute through an employer's spending and investment in the region? In this forecast, individuals are counted based on where they live.

These challenges are unique to the analysis of a district's labour market. As a result, MiHR has adopted conservative estimates in the forecast that were validated through industry consultation. In order to reflect the significantly higher labour mobility at the district level, MiHR doubled the assumed non-retirement exit rate used for the provincial forecasts – from 2 to 4 percent.

¹⁷ See Aging Population Trends in Northern Ontario, http://www.nswpb.ca/census_analysis_reports

Forecast Scenarios

This report presents three forecast scenarios that adjust assumptions to illustrate a range that the hiring requirements may take over the forecast period. The baseline scenario uses a consensus forecast for commodity prices and productivity changes over the forecast period.¹⁸ Accounting for the consensus forecasts, the baseline scenario is the most likely path that hiring requirements will take given the assumptions listed above and current operating environments. The expansionary scenario is one under which commodity prices are expected to be stronger than the consensus forecast (leading to increased mining activity) and, labour productivity lower than the historic trend, providing an upper bound for the hiring requirements forecast. Conversely, the contractionary scenario assumes commodity prices are expected to be weaker than the consensus forecast (leading to less mining activity) and, labour productivity higher than the historic trend, providing a lower bound for the hiring requirements forecast.

In addition to model inputs, information from key informants, Statistics Canada and MiHR research was incorporated to develop the forecast for mining employment in the Thunder Bay District. In particular, the baseline scenario assumes three advanced development projects will go into construction and production in the medium term. The expansionary forecast includes five additional projects (for a total of 8), assuming that the “Ring of Fire” development moves forward as predicted. The model and resulting hiring requirements forecasts are deliberately conservative; taking into account the uncertainty in the economic cycle. This approach assumes that mine development may take longer than the forecast period as projects move through construction and into production phases.

¹⁸ Individual economic forecasts vary widely in complexity, theoretical underpinnings, and confidence in outcomes. A consensus forecast is essentially an amalgamation or averaging of individual predictions from leading forecasters. Consensus forecasts tend to balance out overly pessimistic or optimistic forecasts to present an arguably more balanced viewpoint.

Appendix B

This Appendix lists the North American Industry Classification Codes (NAICS) and National Occupational Classification for Statistics (NOC-S) codes used throughout this report to define the mining industry. MiHR is engaged in ongoing, iterative research to include more NOC-S 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 employment data: the North American Industry Classification System (NAICS) and the National Occupational Classification for Statistics (NOC-S). 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-S system was developed by Statistics Canada and Human Resources and Skills Development Canada (HRSDC) to provide standardized descriptions of the work that Canadians perform in the labour market. NOC-S codes organize labour-force participants according to the nature of work they perform, thereby enabling similar occupations to be grouped. NOC-S 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-S 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-S 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

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. The NAICS codes that define the mining industry include:

- NAICS 212: Mining and Quarrying (except Oil and Gas) This subsector comprises establishments primarily engaged in mining, beneficiating or otherwise preparing metallic and non-metallic minerals, including coal.
- NAICS 213: Support Activities for Mining and Oil and Gas Extraction. This subsector 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.

- 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: Professional sciences and consulting including geosciences, environmental engineering, geophysical surveying and mapping, assay and chemical analysis laboratories, and other surveying and mapping activities.

MiHR uses the following 66 NOC-S codes to define the occupations that are essential to the mining sector. The NOC-S codes have been grouped into their broad occupational category.

The following table show the cumulative hiring requirements by broad occupational category for the Thunder Bay District under the baseline scenario for two-, five- and ten-year periods.

Table A1: Cumulative Hiring Requirements Forecast by Occupational Category--Thunder Bay District, Baseline Scenario—2014, 2017, 2022

	Cumulative Hiring Requirements		
	2014	2017	2022
Trades and Labour Occupations	295	550	1,240
Professional and Physical Science Occupations	35	65	150
Human Resources and Financial Occupations	15	25	55
Support Workers	30	55	130
Technical Occupations	20	40	105
Supervisors, Coordinators, and Foreman	50	95	215
All Other Occupations	245	440	945
Total	690	1,270	2,840

Source: Mining Industry Human Resources Council, January 2012

These requirements can be broken down even further by individual NOC-S and this breakdown is shown in the following table. It should be noted that with smaller regional-specific data sets, such as the ones used here, the error margins for an occupation-specific breakdown are high and the forecasts should be interpreted with caution. Occupational needs will adjust over the forecast period and will be driven by the specific context of the mining operations that develop in the region.

Table A2: Occupational breakdown of Hiring Requirements Forecast—Thunder Bay District
Baseline Scenario—2014, 2017, 2022 (<5 indicates five or less)

Trades and Undesignated Occupations	2014	2017	2022
Underground production and development miners	55	105	235
Labourers in mineral and metal processing	40	70	160
Construction millwrights and industrial mechanics (except textile)	35	65	150
Heavy equipment operators (except crane)	25	45	105
Industrial electricians	20	40	85
Material handlers	15	30	70
Machine operators, mineral and metal processing	15	30	65
Heavy-duty equipment mechanics	15	25	60
Central control and process operators, mineral and metal processing	15	25	55
Truck drivers	15	25	55
Welders and related machine operators	10	20	50
Underground mine service and support workers	10	20	40
Mine labourers	10	15	35
Construction trades helpers and labourers	<5	10	25
Steamfitters, pipefitters and sprinkler system installers	<5	10	20
Drillers and blasters - Surface mining, quarrying and construction	<5	<5	10
Crane operators	<5	<5	10
Carpenters	<5	<5	<5
Plumbers	<5	<5	<5
Other trades helpers and labourers	<5	<5	<5
Total	295	550	1,240
Professional and Physical Science Occupations			
Geologists, geochemists and geophysicists	10	15	40
Mining engineers	<5	15	30
Industrial and manufacturing engineers	<5	10	20
Metallurgical and materials engineers	<5	<5	15
Mechanical engineers	<5	<5	15
Other professional occupations in physical sciences	<5	<5	10
Chemists	<5	<5	<5
Electrical and electronics engineers	<5	<5	<5
Chemical engineers	<5	<5	<5
Civil engineers	<5	<5	<5
Geological engineers	<5	<5	<5
Other professional engineers, n.e.c.	<5	<5	<5
Biologists and related scientists	<5	<5	<5
Total	35	65	150
Human Resources and Financial Occupations			
Financial auditors and accountants	<5	10	25
Human resources managers	<5	<5	10
Financial managers	<5	<5	10

Specialists in human resources	<5	<5	<5
Financial and investment analysts	<5	<5	<5
Total	15	25	55
Support workers			
Inspectors and testers, mineral and metal processing	15	30	65
Dispatchers and radio operators	<5	10	20
Secretaries (except legal and medical)	<5	<5	15
Transportation route and crew schedulers	<5	<5	15
Administrative clerks	<5	<5	10
Production clerks	<5	<5	<5
Construction estimators	<5	<5	<5
Cooks	<5	<5	<5
Inspectors in public and environmental health and occupational health and safety	<5	<5	<5
Engineering inspectors and regulatory officers	<5	<5	<5
Total	30	55	130
Technical Occupations			
Geological and mineral technologists and technicians	10	15	40
Chemical technologists and technicians	<5	10	20
Industrial engineering and manufacturing technologists and technicians	<5	<5	15
Electrical and electronics engineering technologists and technicians	<5	<5	10
Mechanical engineering technologists and technicians	<5	<5	10
Land surveyors	<5	<5	<5
Drafting technologists and technicians	<5	<5	<5
Civil engineering technologists and technicians	<5	<5	<5
Mapping and related technologists and technicians	<5	<5	<5
Land survey technologists and technicians	<5	<5	<5
Biological technologists and technicians	<5	<5	<5
Total	20	40	105
Supervisors, Coordinators, and Foremen			
Supervisors, mineral and metal processing	20	40	85
Supervisors, mining and quarrying	15	30	70
Primary production managers (except agriculture)	10	15	35
Contractors and supervisors, pipefitting trades	<5	<5	15
Engineering managers	<5	<5	10
Construction managers	<5	<5	<5
Contractors and supervisors, mechanic trades	<5	<5	<5
Total	50	95	215

Table A3 below, shows the cumulative hiring requirements over the next decade in the top five occupations in each broad occupational category shown in the main report for the three scenarios.

Trades and Undesignated Occupations	Cumulative Hiring Requirements (2022)		
	Contractionary	Baseline	Expansionary
Underground production and development miners	90	235	340
Labourers in mineral and metal processing	60	160	230
Construction millwrights and industrial mechanics (except textile)	60	150	220
Heavy equipment operators (except crane)	40	105	150
Industrial electricians	35	85	125
Professional and Physical Science Occupations			
Geologists, geochemists and geophysicists	15	40	55
Mining engineers	10	30	45
Industrial and manufacturing engineers	10	20	30
Metallurgical and materials engineers	<5	15	20
Mechanical engineers	<5	15	20
Human Resources and Financial Occupations			
Financial auditors and accountants	10	25	40
Human resources managers	<5	10	15
Financial managers	<5	10	15
Specialists in human resources	<5	<5	10
Financial and investment analysts	<5	<5	10
Support workers			
Inspectors and testers, mineral and metal processing	25	65	95
Dispatchers and radio operators	<5	20	30
Secretaries (except legal and medical)	<5	15	25
Transportation route and crew schedulers	<5	15	20
Administrative clerks	<5	10	10
Technical Occupations			
Geological and mineral technologists and technicians	15	40	55
Chemical technologists and technicians	<5	20	25
Industrial engineering and manufacturing technologists and technicians	<5	15	20
Electrical and electronics engineering technologists and technicians	<5	10	15
Mechanical engineering technologists and technicians	<5	10	15
Supervisors, Coordinators, and Foremen			
Supervisors, mineral and metal processing	35	85	125
Supervisors, mining and quarrying	30	70	105
Primary production managers (except agriculture)	15	35	50
Contractors and supervisors, pipefitting trades	<5	15	25
Engineering managers	<5	10	10



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