



2013

## Nipissing Mining Hiring Requirements Forecasts



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## EMPLOYMENT ONTARIO

*The views expressed in this document do not necessarily reflect those of Employment Ontario.*

This work is the result of an unprecedented partnership among six workforce planning boards in Northern Ontario.



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## Canada

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# Executive Summary

## Executive Summary



Resource-based industries are a vital part of a strong Northern Ontario economy. The discovery of significant mineral deposits in the Ring of Fire, an area in Ontario's Far North, presents major development opportunities in mining that will contribute to the Ontario economy. Development of the mineral deposits in the Ring of Fire area will create jobs and better position the Northern Ontario economy for future sustained growth.

However, human resources challenges threaten this growth potential. Labour market pressures vary considerably among the provinces and territories in Canada — reflecting differences in commodities, the mix of exploration and mining activities, and the size of the labour pool. Research by the Mining Industry Human Resources Council (MiHR) has demonstrated that regional analysis of the mining labour market is very valuable; it provides important intelligence about local industry conditions, labour market pressures, and predictions of future needs.

This report was prepared for the Labour Market Group and deals with the geographic region of Nipissing. Developed from a provincial forecast for Ontario, the forecast presented here was customized to capture the unique conditions and context of mining in Nipissing. This is one of six separate reports on districts across Northern Ontario — the other five include: Sudbury; Cochrane and Timiskaming; Kenora and Rainy River; Algoma; and Thunder Bay. The goal is to empower these districts and others across Ontario to create effective labour market and workforce planning strategies — based on an understanding of mining operations and challenges specific to their region.

Employment in Nipissing is concentrated mainly in retail, construction, trade, accommodation and public administration. Fewer people are employed in primary sectors, such as the mining sector. The education level of the workforce in the district is below the provincial average and there is also a shortage in the skilled trades sector. The aging population, combined with a lack of skilled workers, is a concern for employers. Although the Nipissing District does not have major mining activities, industry demand for skilled workers will be competitive in communities that support mining construction and activities in quarries and aggregate mining. Employers are already indicating that they are faced with a lack of availability of workers that are appropriately trained.



MiHR research indicates employment in the mining sector is more cyclical than in many other industries in Canada.<sup>1</sup> Previous labour market forecasts produced by MiHR show that despite this cyclical nature, future hiring requirements will be quite significant across Canada, even under contractionary (i.e., poor economic outlook) scenarios. These same trends are evident in the labour market forecast for the Nipissing District.

This report uses MiHR's labour market forecasting system, which was developed to produce forecasts of employment and hiring requirements in the mining industry at the national and provincial /territorial levels.<sup>2</sup> This model uses a variety of factors to predict changes in employment in the mining and minerals exploration industry, including commodity prices, productivity factors and demographic data. The forecasts are prepared for two-, five-, and ten-year time horizons, and are presented using three economic scenarios — contractionary, baseline and expansionary. Hiring requirements represent the sum of net change in employment and replacement requirement due to retirement and other exists from the labour force.

MiHR forecasts for Ontario were modified to produce regional forecasts for each of the six areas in question for these reports. Sub-provincial forecasting presents a number of unique challenges that do not exist in preparing forecasts at provincial and national levels. To address these challenges in its methodology, MiHR adapted a number of provincial assumptions to produce district-specific data. Adaptation was based on the outcomes of surveys; key informant interviews conducted as part of this research; and information from each planning board's own research and data collection activities within the district.<sup>3</sup>



1 Canadian Mining Industry Employment and Hiring Forecasts, 2011.

[http://www.mihr.ca/en/publications/resources/employment\\_hiringforecasts2011\\_FINALAug4\\_ENG.pdf](http://www.mihr.ca/en/publications/resources/employment_hiringforecasts2011_FINALAug4_ENG.pdf)

2 The development of the forecast 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.

3 The forecasts presented herein provide custom estimates for the region, based on current information available at the time of production.



Table 1 shows forecasted hiring requirements for the Nipissing mining industry; MiHR defines the industry as including all phases of the mining cycle from prospecting and exploration, advanced development and construction, support services for exploration and mining, extraction, mineral processing, and closure, care and maintenance. Forecasts are presented for three scenarios — baseline, contractionary and expansionary. Mining sector employment in Nipissing was estimated at almost 1,970 workers in 2012. Under the baseline scenario, the projected cumulative hiring requirements over the next 10 years will be approximately 1,890 workers. A projected 1,860 workers would be needed in a contractionary scenario, and 1,920 workers in an expansionary scenario.

**Table 1**  
**Cumulative Hiring Requirements Forecast — Nipissing**  
**By Scenario — 2022**

	Net Change in Employment	Replacement Requirements		Cumulative Hiring Requirements
		Retirement	Non-Retirement	
Contractionary	680	690	510	1,860
Baseline	680	700	510	1,890
Expansionary	710	700	510	1,920

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

Based on discussions with stakeholders, the mining industry in Nipissing faces a number of potential HR issues. These include: issues on retention, attracting local youth to mining professions, poor image of the industry, shortages of skilled labour, and challenges in attracting immigrants to the community.



# Background and Scope

## Background and Scope



Human resources challenges are one of the greatest threats to the future competitiveness of the Canadian mining industry.<sup>4</sup> A number of factors contribute to these significant challenges, including the looming retirement of the baby-boom generation, the struggle to attract and engage younger workers, and an under-representation of diverse groups such as Aboriginal peoples, women and new Canadians. While the industry has made tremendous strides in addressing these issues, finding experienced and skilled workers is becoming more difficult, and competition continues to increase across all sectors of the Canadian economy.

Labour market pressures vary considerably among the prov-

inces and territories — reflecting differences in commodities, the mix of exploration and mining activities, and the size of the labour pool. Research by the Mining Industry Human Resources Council (MiHR) has demonstrated that regional analysis of the mining labour market is very valuable; it provides important intelligence about local industry conditions, labour market pressures, and predictions of future needs.

This report was prepared for the Labour Market Group and deals with the geographic region of Nipissing. Developed from a provincial forecast for Ontario, the forecast presented here was customized to capture the unique conditions and context of mining in Nipissing. This is one of six separate reports on districts across Northern Ontario — the results of a cutting-edge partnership between MiHR and six Northern Ontario workforce planning boards. Each report presents a regional-level outlook that follows MiHR's labour market forecasting model.

Reports have also been prepared for five other Northern Ontario regions: Sudbury; Cochrane and Timiskaming; Kenora and Rainy River; Algoma; and Thunder Bay. The goal is to empower these districts and others across Ontario to create effective labour market and workforce planning strategies — based on an understanding of mining operations and challenges specific to their region.

<sup>4</sup> Ernst and Young, *Business Risks Facing Mining and Metals*, 2010.



## MiHR's Labour Market Forecasting System

This report uses MiHR's labour market forecasting system, which was developed to produce forecasts of employment and hiring requirements in the mining industry at the national and provincial /territorial levels.<sup>5</sup> This model uses a variety of factors to predict changes in employment in the mining and minerals exploration industry, including commodity prices, productivity factors and demographic data. The forecasts are prepared for two-, five-, and ten-year time horizons, and are presented using three economic scenarios — contractionary, baseline and expansionary.

The data inputs to the MiHR forecasting model include Statistics Canada data (including, but not limited to, Census and Labour Force Survey), inputs on several economic indicators, and Natural Resources Canada data. This was supplemented and adjusted using primary research sources — region-specific analysis, mining sector employer surveys and key informant interviews. A general description of the forecast methodology can be found in Appendix A, along with an explanation of the underlying assumptions used to generate the Nipissing District hiring requirements forecasts.

Sub-provincial forecasting presents a number of unique challenges that do not exist in preparing forecasts at provincial and national levels. These include limited access to data from traditional Labour Market Information (LMI) data sources; high labour mobility; and the fact that workers may live outside the region in which they work (and vice-versa). To address these challenges in its methodology, MiHR adapted a number of provincial assumptions to produce district-specific data. Adaptation was based on the outcomes of surveys; key informant interviews conducted as part of this research; and information from each planning board's own research and data collection activities within the district.<sup>6</sup>

### 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 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.

The industry is mainly defined using North American Industry Classification Codes (NAICS) and National Occupational Classification for Statistics (NOC-S) codes. Statistics Canada and other LMI sources organize their data according to these classification codes. Together, the NAICS and NOC-S systems allow MiHR to group statistics to obtain estimates of employment and workforce demographics. Details on the NAICS and NOC-S codes included in the forecasts are found in Appendix B.

Each district was defined according to Statistics Canada's economic districts, as shown in Figure 1. Findings from primary research were used to further define local scope; set region-specific context; verify and validate data from other sources; determine the unique occupational structure of the local workforce; and provide local measurements for diversity, workforce mobility, turnover and average age at retirement. To acquire this local information, MiHR reached out to industry stakeholders in the districts through a survey on mining industry profile, labour market needs and human resources trends.

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<sup>5</sup> The development of the forecast 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.

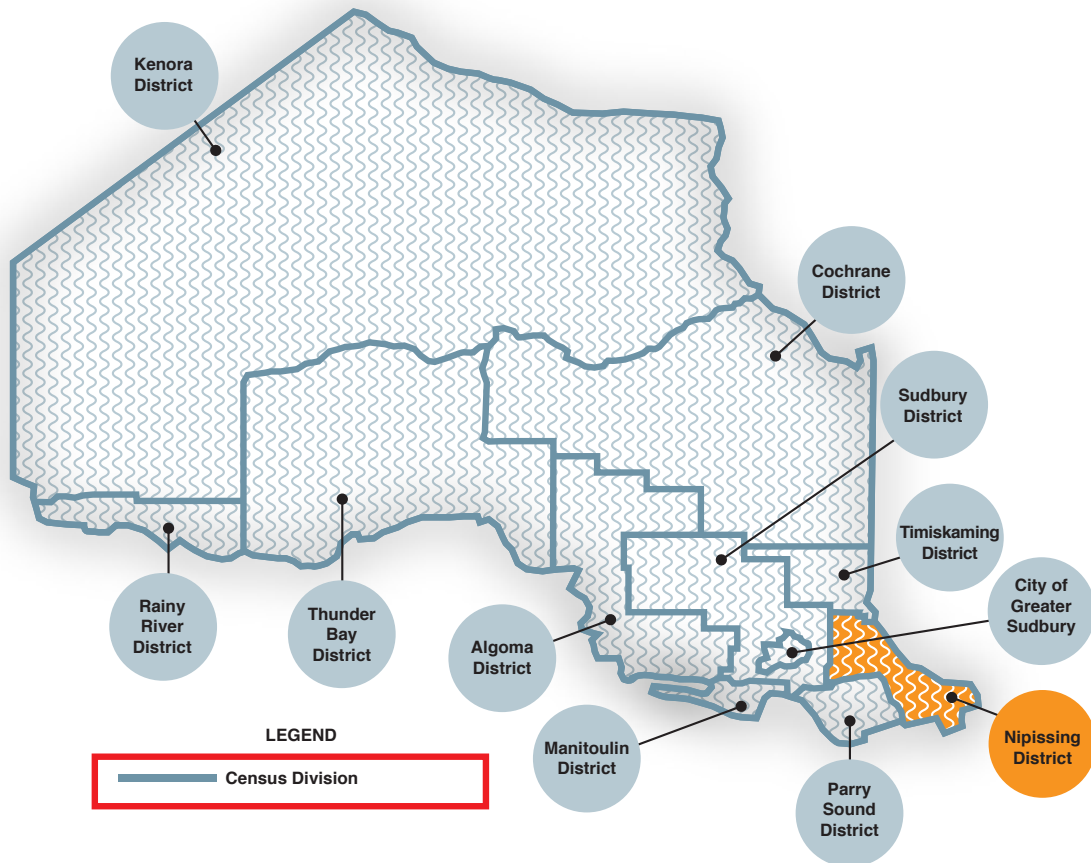
<sup>6</sup> The forecasts presented herein provide custom estimates for the region, based on current information available at the time of production.



## District Research

In Nipissing, 16 employers participated in surveys and interviews. Stakeholders included government, education, industry associations and employers in exploration and mine construction/development, and in mining support-services sectors. These inputs guided MiHR to validate and adjust assumptions used in its employment modelling and forecasts for the district.

Figure 1 – Ontario Districts





# Economic Overview and Regional Labour Market



## Economic Overview and Regional Labour Market

The global economic recovery stalled due to increased uncertainty in the second half of 2011; as a result, the outlook for global growth deteriorated in the last two quarters of the year. The key factor underlying this deterioration was the ongoing euro-area sovereign debt and banking crisis. With the continued uncertainty, global exploration and mining activity slowed in 2012, casting a shadow of doubt over industry prospects for the near-term.



However, fluctuations are a reality in the mining industry and overall — despite recent activities — the economic outlook is cautiously optimistic. In the United States, the largest single customer for Canadian output and production, the economy has shown signs of gathering momentum for sustained growth since the fall of 2011. Consumer confidence in the U.S. increased in 2012 from the near-record lows of August 2011, and output growth accelerated in both the U.S. manufacturing and non-manufacturing sectors. In addition, demand for Canadian commodities continues to grow as China, India, Brazil and other nations further develop their economies.

### Canadian Economic Overview

Canadian exploration activity slackened in 2012 and industry information indicates that exploration expenditures did not meet anticipated levels during the second half of the year. As a result, the exploration and mining sector operated under a blanket of caution in the latter part of 2012. Nonetheless, Canada's economic outlook remains positive amid continued international uncertainty and a tenuous global recovery. Canadian economic growth is forecast to be modest in the near term and then to gradually and moderately increase over the forecast horizon, as demand for Canada's natural resources continues.

### Canada's Recent Economic Performance

Canada's economic performance over the 2008-09 recession and throughout the recovery period has been strong relative to peer countries. This strength reflects Canada's sound economic, fiscal and financial-sector fundamentals, along with the support provided under the federal economic-stimulus package. As a result, Canada's real GDP is well above pre-recession levels — the best performance in the G-7 countries.

Canada posted the strongest growth in employment in the G-7 during the recovery period — with both the quantity and quality of new employment exceeding expectations. Overall, Canada has regained the employment ground lost during the recent recession. About 90 per cent of the added jobs were full-time positions, with over three-quarters in high-wage industries in the private sector. As of mid-year 2012, Canadian businesses were continuing to hire, even though the federal government's temporary stimulus program had ended.

In an October 2012 update of Canada's fiscal and economic outlook, the federal government predicted that real GDP growth would be lower than private-sector forecasters had projected in early 2012. The new federal forecast called for stronger growth in 2014 and 2015.

The largest impact in Canada of the recent global economic turbulence has been fluctuations in commodity prices — generally resulting in lower prices.

The European crisis and its impact on growing economies, including China, remains a drag on world economies. In North America, however, both Canadian and U.S. governments have indicated they will act as needed to provide stimulus to help sustain recovery. This is a clear message to other countries and to industry to continue to invest in North American economies. In early 2012, investment in Canada was well above pre-recession levels at an annualized rate of 9.4 per cent.

### **Mining Industry Economic Overview and Outlook**

In sync with other industrial sectors in the economy, the Canadian mining sector's GDP rebounded in 2010 after 2009's unprecedented and precipitous decline — increasing by 15 per cent over the levels of the previous year. The sector responded quickly to international demand with strong exports in 2010.

Globalization of international trade and rebounding demand for Canada's mineral resources have stimulated the Canadian industry's recovery; however, in mid-2011, the uncertainties associated with weak markets returned due to a number of developments, including a slowdown in the U.S. economy and higher than anticipated inflation in China. These trends and others produced a temporary shock to demand for Canadian metals and minerals and resulted in much lower prices.

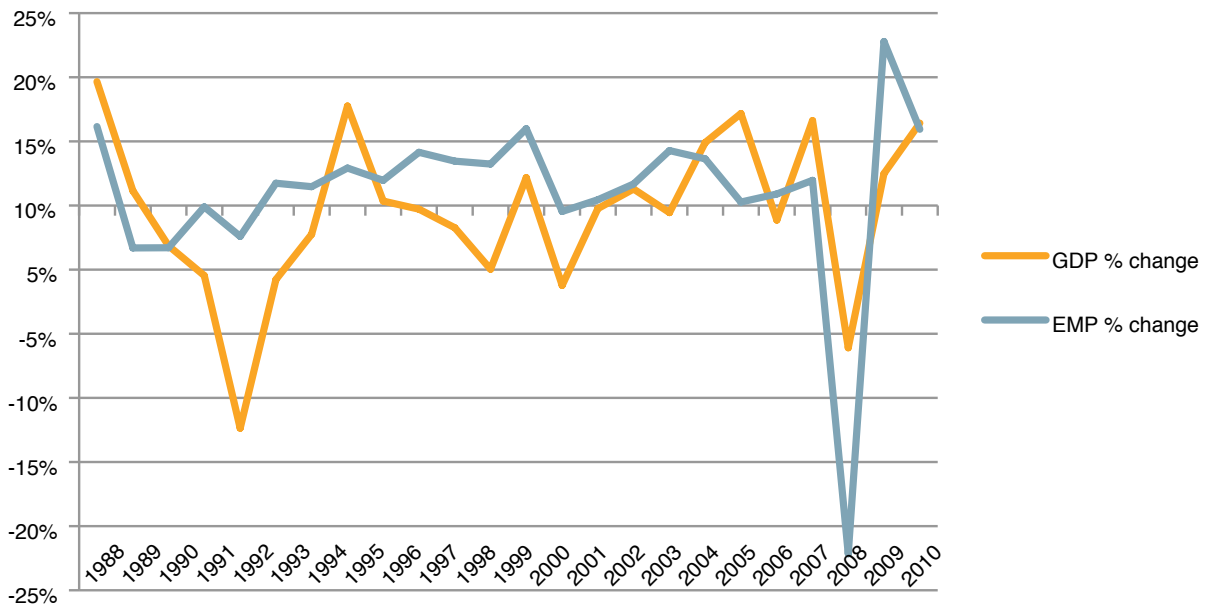
Despite this cyclical rollercoaster, demand for Canadian metals and minerals is expected to grow in the long term. This prediction arises from the gradual but stable economic growth in the U.S., and from the relatively high economic growth rates of China, India and Brazil. These countries' large domestic markets for Canadian exports of base metals, potash and potassium compounds, and coal bode well for additional incremental demand for Canadian metals and minerals in the near term, as well.

### **Canadian Mining Industry Employment**

The mining industry directly employs over 235,000 people in Canada. Employment in the sector reflects a net increase of 15 per cent during the last six years, or an average increase of 2.5 per cent year-over-year between 2004 and 2010. Canadian mining industry employment is sensitive to changes in GDP. Figures 2 and 3 depict this relationship in Canada and in Ontario.

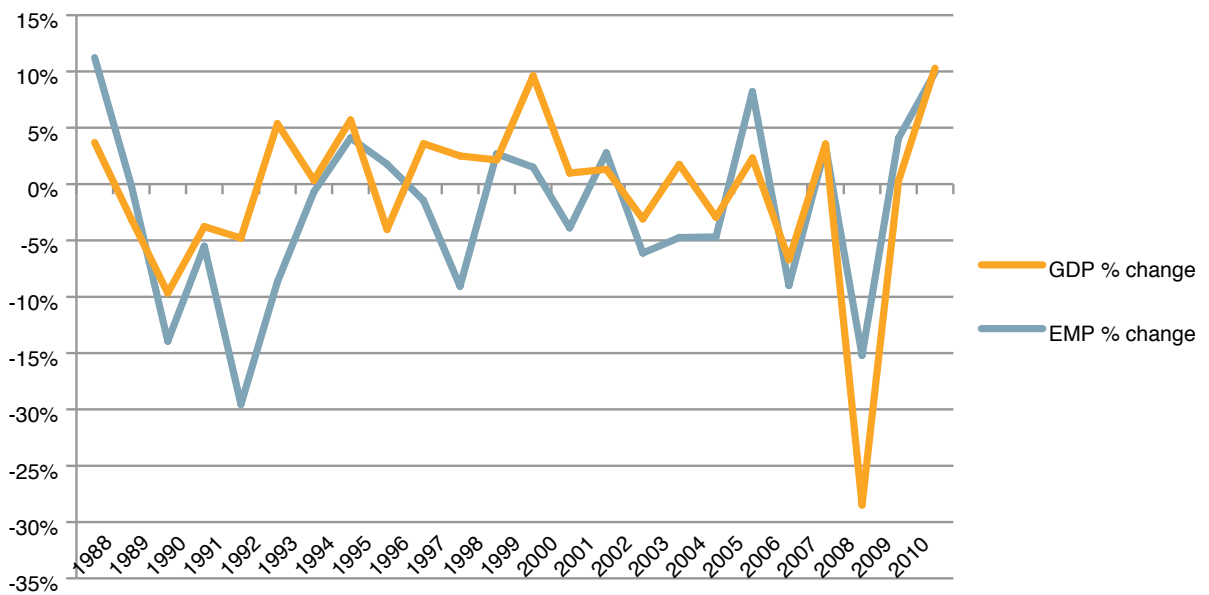


Figure 2 – Employment and GDP Mining – Canada



Source: Mining Industry Human Resources Council

Figure 3 – Employment and GDP Mining - Ontario



Source: Mining Industry Human Resources Council

## The Northern Ontario Mining Industry and the Ring of Fire

Resource-based industries are a vital part of a strong Northern Ontario economy. The discovery of significant mineral deposits in the Ring of Fire, an area in Ontario's Far North, presents major development opportunities in mining that will contribute to the Ontario economy. Development of the mineral deposits in the Ring of Fire area will create jobs and better position the Northern Ontario economy for future sustained growth. According to recent feasibility and impact studies, the mine developments currently under consideration in the Ring of Fire are expected to create more than 1,500 permanent jobs, once the mines are in full production. In addition, related jobs will be created in the mining service and supply sector.

## Regional Labour Market

Employment in Nipissing is concentrated mainly in retail, construction, trade, accommodation and public administration. Fewer people are employed in primary sectors, such as the mining sector. The education level of the workforce in the district is below the provincial average and there is also a shortage in the skilled trades sector. This has become a major issue in light of the strategic importance of construction, mining supply and the trades in many of the district's communities.

The Nipissing District workforce is aging. Efforts to increase the limited size of the labour pool of skilled individuals are difficult, given the district's current profile and the median age of 44. The aging population, combined with a lack of skilled workers, is a concern for employers. There seems to be a mismatch of employers' requirement for workers and workers looking for work. Consequently, those seeking employment find themselves without the requisite skills to fill the local job vacancies.

Although the Nipissing District does not have major mining activities, industry demand for skilled workers will be competitive in communities that support mining construction and activities in quarries and aggregate mining. Employers are already indicating that they are faced with a lack of availability of workers that are appropriately trained.



Regional respondents to MiHR's survey questionnaire indicated that employment in exploration, development and support activities will likely increase in the region beginning in 2015. Nearly two-thirds of employers reported business conditions as favourable and most expected conditions to remain the same or improve in the year ahead. Responding employers came from a wide range of size of company and larger employers reported using a proactive approach to workforce planning. Most employers stated that they react quickly (within 6 months) to economic conditions.

Respondents indicated that approximately 83 per cent of their non-Aboriginal workforce live in the region, with some employers reporting as much as 100 per cent local workforces and others reporting as few as 25 per cent. Workers mainly commute into the region from elsewhere in Ontario, and some employers reported commuters coming from Quebec. Turnover or churn was reported at an average of about 10 per cent for employers, but ranged between less than 1 per cent to as much as 45 per cent, depending on the employer's activities and operating context.

### **Support Services for Mining and Mine Construction**

The demand for qualified and skilled workers in Nipissing is going to outstrip the existing labour supply. Advances in ever-changing technology, and employer demands that potential employees be abreast of technological developments in business and information technology, underscore the need for more experienced workers.

Respondents to MiHR's survey reported that on average just under 60 per cent of their workforce is at a high school level of education, 30 per cent have completed college education, 25 per cent have received trade certification and approximately 15 per cent have a university level of education. Slightly more than half of employers reported outsourcing at least one component of education and training for their organization, including health and safety, Common Core training, leadership and managerial, apprenticeships, skills development and language training.

Employers in the region rely most heavily on word of mouth, online job boards, referrals from existing employees, and newspapers and other print media when recruiting talent—a trend common with exploration and support services employers in Canada. Very few surveyed employers reported using social media, radio or TV, or job fairs to find talent.

The Nipissing Aboriginal communities are relatively small at 2 per cent of the total population. In addition, education levels are below the provincial average. Increased outreach and collaboration with the small Aboriginal communities is one way to enhance education levels, while helping to increase the district's limited labour pool.

Responses to MiHR's survey showed that less than 3 per cent of workforces are Aboriginal peoples; with a range of less than 1 per cent to as much as 15 per cent. Note that these are averages from a sample of employers and not all employers responded to this question—it is assumed that participation could be much higher in individual companies in the region. Many of the Aboriginal people employed in the industry are in entry level, trades and support occupations. Stakeholders from industry, education, and communities expressed an opportunity for local employers to continue and increase collaboration with Aboriginal communities.

Other demographic characteristics of the survey respondents' workforces are similar to the national patterns observed for mining. About 16 per cent of respondents' workforces are female, slightly above the national average for the industry, with a range of less than 5 per cent to as much as 40 per cent. Employers reported less than 2 per cent of their workforces are new Canadians or temporary foreign workers. The North Bay Multicultural Centre reports that, over the last 5 years, approximately 200 immigrants per year are settling in town, many from the Greater Toronto Area. Continued efforts to attract newcomers with the required skill levels to work in, and help develop the district, will enhance workforce growth.





## Nipissing District Hiring Requirements



## Nipissing District Hiring Requirements



MiHR research indicates employment in the mining sector is more cyclical than in many other industries in Canada.<sup>7</sup> Previous labour market forecasts produced by MiHR show that despite this cyclical nature, future hiring requirements will be quite significant across Canada, even under contractionary (i.e., poor economic outlook) scenarios. MiHR's 2012 projections for all of Canada forecast mining hiring requirements ranging from 118,600 to 196,300 workers over the next 10 years. Even with a very moderate outlook, MiHR's baseline scenario for the Canadian mining industry predicts the need to hire approximately 147,400 workers over the next 10 years.

Projections for Ontario mirror the national trends. The range for Ontario mining hiring projections is an estimated 51,600 to 65,800 workers. Even under a moderate hiring outlook (the baseline scenario), MiHR projects the need to hire over 59,000 workers in Ontario over the next 10 years — slightly shy of one-third of the total mining hiring requirements for all of Canada.

These same trends are evident in the labour market forecast for the Nipissing District. Even under a contractionary scenario — where total employment in the mining sector increases by 29 percent — more than 1,860 workers will need to be hired to offset workforce attrition due to retirements and other separations.

<sup>7</sup> Canadian Mining Industry Employment and Hiring Forecasts, 2011.  
[http://www.mihhr.ca/en/publications/resources/employment\\_hiringforecasts2011\\_FINALAug4\\_ENG.pdf](http://www.mihhr.ca/en/publications/resources/employment_hiringforecasts2011_FINALAug4_ENG.pdf)

## Cumulative Hiring Requirements Forecast

Table 1 shows forecasted hiring requirements for the Nipissing mining industry for three scenarios – baseline, contractionary and expansionary. (Details on scenario development and assumptions can be found in Appendix A). Mining sector employment in Nipissing was estimated at almost 1,970 workers in 2012. Under the baseline scenario, the projected cumulative hiring requirements over the next 10 years will be approximately 1,890 workers. A projected 1,860 workers would be needed in a contractionary scenario, and 1,920 workers in an expansionary scenario.

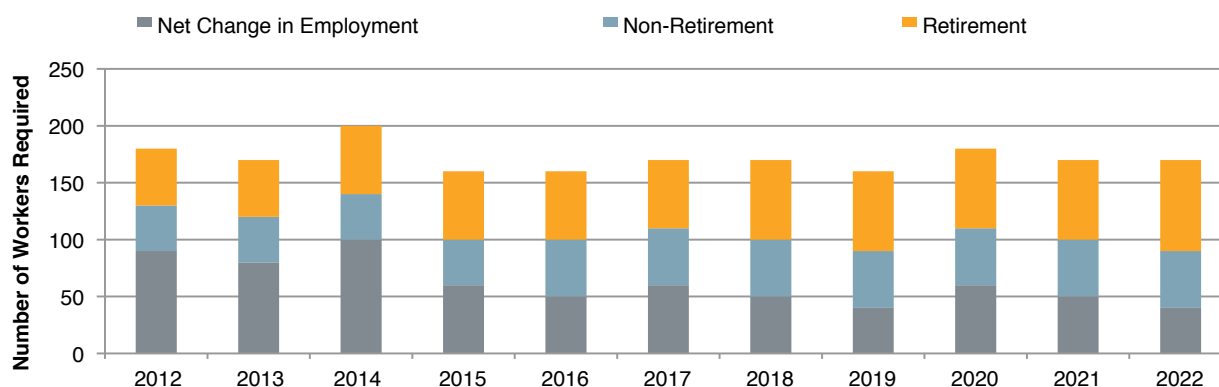
Table 1  
Cumulative Hiring Requirements Forecast – Nipissing  
By Scenario – 2022

	Net Change in Employment	Replacement Requirements		Cumulative Hiring Requirements
		Retirement	Non-Retirement Separation	
Contractionary	680	690	510	1,860
Baseline	680	700	510	1,890
Expansionary	710	700	510	1,920

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

Figure 4 shows the hiring requirements for Nipissing on a year-over-year basis, for the baseline scenario.

Figure 4  
Annual Hiring Requirements Forecasts – Nipissing  
Baseline Scenario – 2012 to 2022

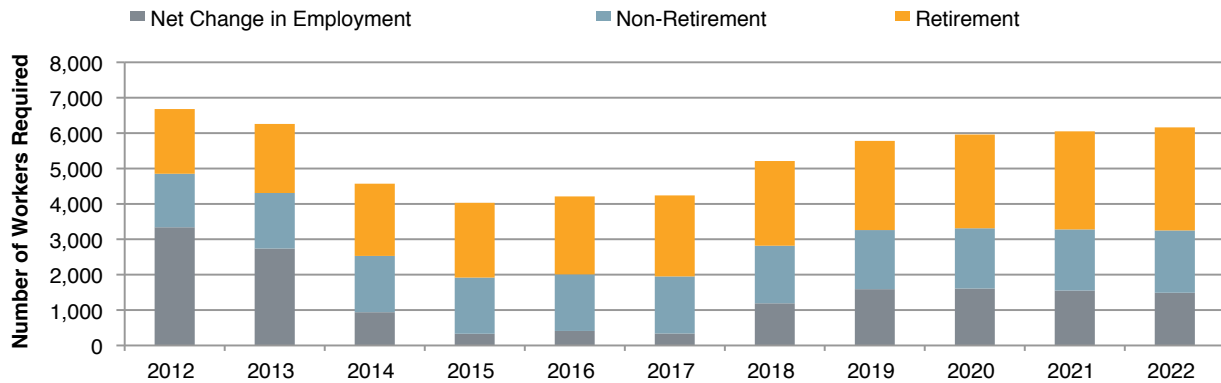


Source: Mining Industry Human Resources Council

As shown in Figure 5, the Ontario mining industry as a whole shows cumulative hiring requirements of approximately 59,000 workers. These requirements are driven by a combination of replacement demands and industry expansion.



**Figure 5**  
Annual Hiring Requirements Forecasts – Ontario  
Baseline Scenario – 2012 to 2022



Source: Mining Industry Human Resources Council

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

**Table 2**  
Cumulative Hiring Requirements Forecast – Nipissing by Scenario – 2014, 2017, 2022

	Cumulative Hiring Requirements		
	2014	2017	2022
Contractionary	550	1,030	1,860
Baseline	550	1,050	1,890
Expansionary	570	1,070	1,920

Source: Mining Industry Human Resources Council, December 2012

## Hiring Requirements Forecast By Occupation

The occupational hiring requirements for the Nipissing District 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 occupational structure of the mining workforce shifts over time. Such a shift would occur, for example, when mine development moves from the construction phase into the production phases. The estimates in Table 3 provide an indication of needs for training and other supports in Nipissing, in 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; these are jobs also 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 Category<sup>8</sup> – Nipissing District  
Baseline Scenario – 2014, 2017, 2022

	Cumulative Hiring Requirements		
	2014	2017	2022
Trades and Production Occupations	250	470	850
Professional and Physical Science Occupations	20	50	100
Human Resources and Financial Occupations	5	25	50
Support Workers	15	35	60
Technical Occupations	15	35	70
Supervisors, Coordinators, and Foremen	35	80	145
All Other Occupations	210	355	615
<b>Total</b>	<b>550</b>	<b>1050</b>	<b>1890</b>

Source: Mining Industry Human Resources Council, December 2012

These requirements can be broken down even further by individual NOC-S codes and this breakdown is shown in Table 4. 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.

<sup>8</sup> 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:  
Occupational Breakdown of Hiring Requirements Forecast — Nipissing  
Baseline Scenario — to 2022

<b>Trades and Production Occupations</b>	
Underground production and development miners	155
Workers in mineral and metal processing	105
Construction millwrights and industrial mechanics (except textile)	100
Heavy equipment operators (except crane)	70
Industrial electricians	55
Crane operators	45
Machine operators, mineral and metal processing	45
Central control and process operators, mineral and metal processing	45
Heavy-duty equipment mechanics	40
Truck drivers	35
Material handlers	35
Welders and related machine operators	35
Underground mine service and support workers	25
Mine labourers	20
Construction trades helpers and labourers	15
Steamfitters, pipefitters and sprinkler system installers	10
Drillers and blasters — Surface mining, quarrying and construction	10
Carpenters	5
Plumbers	0
Other trades helpers and labourers	0
<b>Total</b>	<b>850</b>
<b>Professional and Physical Science Occupations</b>	
Geologists, geochemists and geophysicists	25
Mining engineers	20
Industrial and manufacturing engineers	15
Metallurgical and materials engineers	10
Mechanical engineers	10
Other professional occupations in physical sciences	10
Chemists	5
Electrical and electronics engineers	5
Chemical engineers	0
Civil engineers	0
Geological engineers	0
Other professional engineers, n.e.c.	0
Biologists and related scientists	0
<b>Total</b>	<b>100</b>

<b>Human Resources and Financial Occupations</b>	
Financial auditors and accountants	20
Human resources managers	10
Financial managers	10
Specialists in human resources	5
Financial and investment analysts	5
<b>Total</b>	<b>50</b>

<b>Support workers</b>	
Inspectors and testers, mineral and metal processing	20
Production clerks	10
Secretaries (except legal and medical)	10
Dispatchers and radio operators	10
Inspectors in public and environmental health and occupational health and safety	5
Administrative clerks	5
Transportation route and crew schedulers	0
Construction estimators	0
Engineering inspectors and regulatory officers	0
Cooks	0
<b>Total</b>	<b>60</b>

<b>Technical Occupations</b>	
Geological and mineral technologists and technicians	25
Chemical technologists and technicians	15
Industrial engineering and manufacturing technologists and technicians	10
Electrical and electronics engineering technologists and technicians	5
Mechanical engineering technologists and technicians	5
Drafting technologists and technicians	5
Land surveyors	5
Mapping and related technologists and technicians	0
Land survey technologists and technicians	0
Civil engineering technologists and technicians	0
Biological technologists and technicians	0
<b>Total</b>	<b>70</b>

## Supervisors, Coordinators, and Foremen

Supervisors, mineral and metal processing	60
Supervisors, mining and quarrying	50
Primary production managers (except agriculture)	25
Contractors and supervisors, mechanic trades	5
Engineering managers	5
Construction managers	0
Contractors and supervisors, pipefitting trades	0
<b>Total</b>	<b>145</b>

Source: Mining Industry Human Resources Council, December 2012

## Notable Trends and Potential HR Issues

Based on discussions with stakeholders, the mining industry in Nipissing faces a number of potential HR issues. These include: issues on retention, attracting local youth to mining professions, shortages of skilled labour, and challenges in attracting immigrants to the community. For example:

- Nipissing is in close proximity to Southern Ontario urban centres. This creates significant challenges in retaining professionals, especially engineers.
- Continued priority should be given to investment in local talent and encouraging local youth to pursue careers in mining construction and support services. Many local initiatives have been developed over the years in Nipissing to provide awareness of mining related careers. These projects and partnerships need to continue in order to keep mining at the forefront of training and development programs.
- The mining industry's image in the region is a potential deterrent to attracting youth. Therefore, outreach to youth, and improving the industry's brand in the community, is one possible means to filling future needs. The local Planning Board in Nipissing along with many additional community partners have spearheaded several mining related initiatives in recent years. Among these include: Mining Week activities for students, the development of bursaries and scholarships, class visits, guest speakers, teachers tours, Mining In A Box, Explore the Trades events and many others.
- Retirements were another theme that emerged during research in the district. Participants expressed concern that a high rate of retirement affects productivity. In addition, there is shared concern among local employers that skills shortages will increase significantly due to retirements.
- Training and skills development was also a common theme with participants. Attempts to accelerate training in skilled labour occupations are being hindered by lack of apprenticeship opportunities. In addition, the lack of safety training for new graduates is a concern with new hires.
- Participants noted that most of the small mining-equipment manufacturing companies successfully retained their workforce during the most recent economic downturn. Employees collectively agreed to reduced hours of work, enabling them to remain employed during the slowdown.

- Aboriginal participation and attracting immigrants to the district were also cited among top-of-mind hiring challenges.

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

- On an occupational basis, the greatest hiring requirements in the region are in the “*trades and undesignated occupations*.” This is consistent with the requirements that MiHR has found across the country. The production and extraction phases of mining are labour-intensive, and skilled workers such as millwrights and electricians, heavy equipment operators and truck drivers hold highly transferable skills. The Nipissing mining sector will face stiff competition for workers with these skill sets.
- The category with the second-greatest hiring requirements is “*supervisors, coordinators, and foremen*.” These supervisory roles are normally occupied by employees with significant experience in the industry, and a majority of these workers are eligible to retire over the next decade.
- Although some occupational categories have comparatively lower hiring requirements, they may still pose a recruitment challenge. “*Professional and physical science*” and “*technician and technology*” occupations, for example, require workers who are both educated and experienced. The number of workers sought may be lower but these positions can prove difficult to fill — largely because the qualified personnel are highly mobile, and have higher levels of formal education and adaptable skill sets. This makes attracting and retaining them difficult and resource-intensive.
- Across Canada, there is a trend towards under-utilizing Aboriginal talent. In mining, Aboriginal employees are employed mainly in labour and support roles. Industry and education partnerships to provide advanced education opportunities for members of local Aboriginal communities could potentially ease the pressures that Nipissing District employers will experience as they attempt to source critical talent for jobs in the physical sciences and engineering, and in 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. Nipissing district has achieved positive results by implementing successful strategies to attract immigrant talent from large cities. Enhancement of these strategies will allow the community to build capacity for supporting an immigrant workforce.





# Available Talent—Ontario

## Available Talent – Ontario



A natural reaction to MiHR’s hiring requirements forecasts is a desire to know more about 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. Currently, these talent projections have been developed at the provincial level only — largely due to challenges with reliably tracking mobility rates at a sub-provincial level.

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 a specific region, assuming that the region 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 Nipissing District can expect to face in addressing its hiring needs over the next decade. They also help to inform the recommendations at the end of this section on ways to increase the region’s share of available talent, as well as potential strategies to grow the talent pool.

### Forecasting Talent Availability for the Province of Ontario

MiHR’s model for available talent includes specific occupations identified as critical to the mining industry. The model first projects the pool of labour that the mining industry is expected to draw from — from each occupation — and then predicts the proportion of that pool that the industry will successfully attract in a given year.

The share of talent that the mining industry is able to attract varies among occupations — depending on how specific an occupation is to the mining industry. For example, the mining industry has historically attracted approximately 100 per cent of underground mine service and support workers, but only 3 per cent of HR specialists. The predicted share for the mining industry is based on historic patterns — reflecting mining’s traditional capacity to attract and retain talent compared to all other industries drawing from the same occupation pool. Talent share is typically stable over time. As the mining industry attempts to increase its own share, it is likely that competition from other industries will intensify in response.

### Available Talent for Ontario Mining

Although a number of the occupations included in the data set are specific to mining, many are not; therefore, total supply of talent was forecast by occupation across all industries. This allowed MiHR to assess the potential pool of Ontario workers available to the mining industry. The analysis also estimates the number of workers in each occupation that are historically attracted to mining — permitting an assessment of the relative tightness of the mining labour market for each occupation.

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

The available talent for each occupation can be reasonably estimated using predictions for new entrants into the labour market — based on migration trends, school leavers and people re-entering the labour market. This model assumes relative equilibrium in current supply. It also 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 5 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 509,800 new entrants into Ontario's labour force for the selected 66 occupations. Historically, the mining industry in Ontario has attracted 3 per cent of new entrants. Assuming this rate remains constant Ontario's mining industry can expect to attract 14,900 new entrants over the next 10 years.

**Table 5**  
Cumulative Available Talent, Ontario — All Sectors and Mining  
66 Occupations — 2014, 2017, 2022

	2014	2017	2022
Total entrants for 66 occupations, all industry sectors	137,900	277,000	509,800
Mining's share of entrants for 66 occupations (assuming the historic rate of 3 per cent)	4,000	8,000	14,900

Source: Mining Industry Human Resources Council, December 2012





# Addressing the Gaps



## Addressing the Gaps

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 does not rest with industry employers alone, but also with industry associations, community stakeholders, educational institutions and governments. By working together to support the mining industry's ability to attract talent, stakeholders will enable a key economic sector to progress to the benefit of Ontario's economy as a whole.

### Increasing Mining's Share of Available Talent

In some cases, industry, education and government must aim to attract more entrants from an existing pool (i.e., carve out a larger slice of the talent pie); however, this is not an easy undertaking. As mining competes for more of its traditional share of the talent pool, other industries will respond with attempts to maintain or expand their own shares; the competition for talent will simply increase.

Furthermore, 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 a bid to retain talent. These strategies may result in short-term gains, but quickly become unsustainable.

To address these types of gaps, employers, educational institutions and governments can do the following:

- Work together to promote careers in Ontario mining to youth, workers in other provinces and new immigrants. The Nipissing district is in close proximity to southern urban centres, where new immigrants tend to initially settle; which presents an opportunity for the district in filling skilled talent needs.
- Support the career-awareness and outreach activities of various associations, such as the local planning boards. The district has advanced education institutions and training facilities that can provide the talent the industry needs, if coordination and communication between industry, education, and new job seekers is supported and encouraged.
- Adopt a consistent industry brand that promotes positive impressions of mining careers 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 members of local Aboriginal communities. Stakeholders expressed a need to better coordinate and work with local Aboriginal communities to promote education and awareness of industry opportunities. Aboriginal peoples tend to be under-utilized and employed mainly in entry level and production roles in Canadian mining. Encourage education and training to higher levels with local communities and raise awareness of the various careers in professional and knowledge worker roles.

## Growing the Talent Pool

In some cases, there simply aren't enough people in the talent pool to meet the mining industry's needs. The industry and its counterparts in educational institutions 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 among employers, government, educators and industry associations.

Targeted efforts to re-attract retirees and retain mature workers have proven to be good mitigation strategies where talent — and particularly experienced talent — are 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 educators could explore ways to increase flexibility in apprenticeship and skills-training programs to develop new workers at a faster rate, without compromising quality of training. Industry and local education institutions, working together on these issues, can find cost effective and efficient solutions—such as, work partnerships, commitments to hire apprentices and support for training institutions in offering practical learning experiences and shared training space in decommissioned areas of mining activities on site.
- Enhance participation and collaboration by all stakeholders — especially employer representatives — in local education task forces, planning boards and committees. Despite a lack of mining activity in the district, it is an important hub for many contractors and mine construction employers who train, hire, and develop local talent for mining activities and contracts in other districts. Including these employers in district planning activities will reinforce their importance in the region and ensure that the region is well situated to support and retain them as the competition for talent in mining heats up.
- Coordinate industry efforts with local educational institutions to provide work-experience programs and encourage graduates to remain in the local area. Employer needs are usually more immediate than what educational institutions can adjust for. Longer planning horizons for employers and close channels of communication with educational institutions can help to narrow this gap. Stakeholders in the district also expressed a challenge with keeping local graduates in the area, and/or reluctance to reach out to local education institutions in recruiting talent. It will take coordinated efforts to overcome challenges like these.
- Develop a communication strategy targeted at public and separate schools to promote the mining sector as an attractive option, working with key educators ( e.g., principals, guidance counsellors and teachers) to integrate mining curriculum and programming—consider expanding upon the work of the Prospectors and Developers Association (PDAC's) *Mining Matters*.
- Invest in pre-employment and in-house training programs to ensure equal opportunities for all communities of interest, ensuring smooth transitions from training to employment.



## Appendices

## Appendix A

This appendix outlines the methodology used by MiHR 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 used to develop the Nipissing District's forecasts.

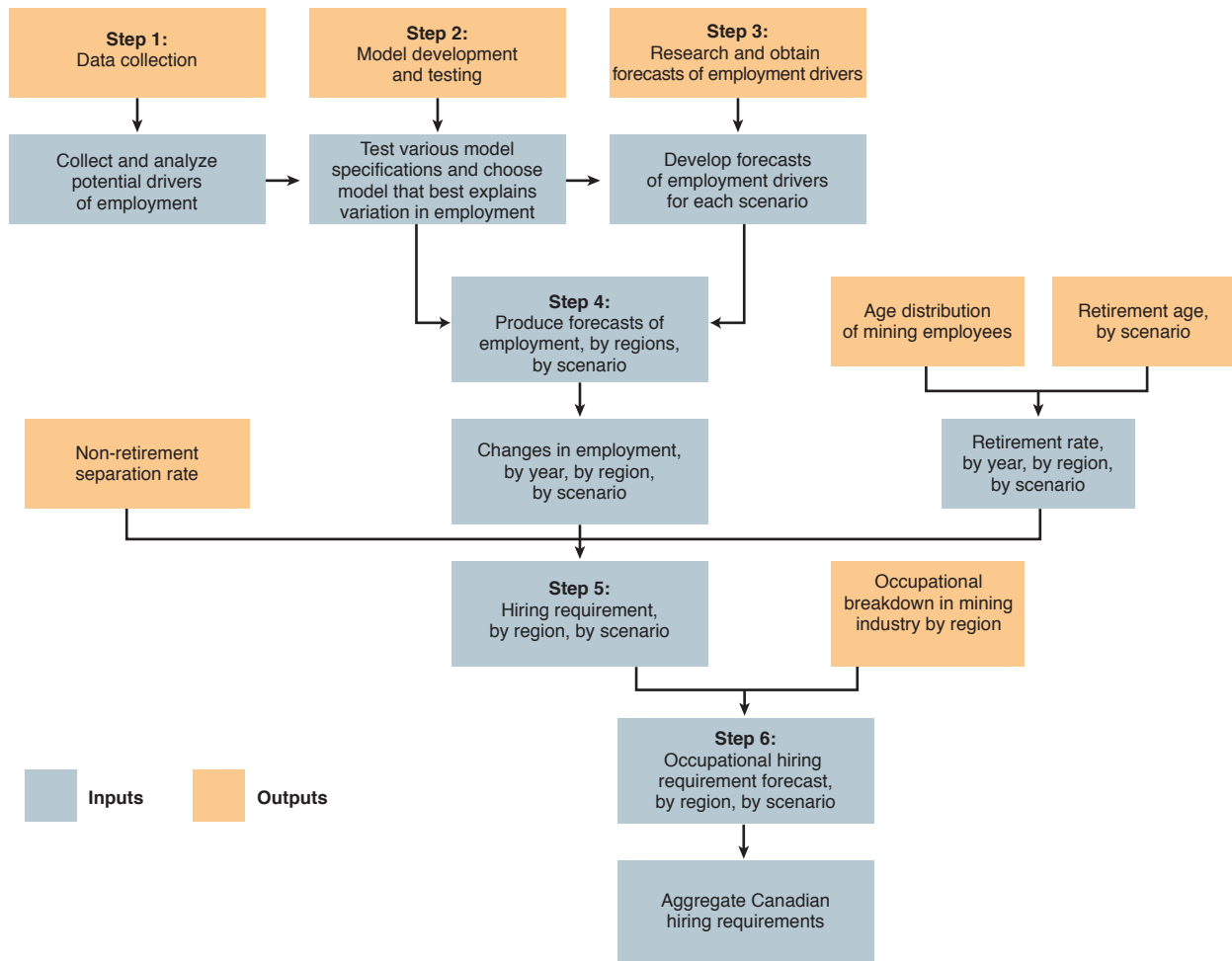
Models of employment were estimated based on the following six steps:

- 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 Nipissing 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 levels of labour mobility.



Figure A1

Employment and Hiring Requirements Forecasting Model



Source: Mining Industry Human Resources Council, December 2012

## 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 Nipissing hiring requirements forecasts are the result of adjusting and partitioning 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 2011 Census, Labour Force Survey data, and data collected in the district – triangulated with data from key informant interviews and a survey of industry employers.

## Labour Productivity

Labour productivity is influenced by various factors and trends that affect the level of a sector's output over time — for example, technology advancements and training can increase workers' 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 Nipissing District's mining labour productivity is assumed to be identical to the productivity forecast for the Ontario mining industry as a whole.

## Minerals and Metals Prices

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 on minerals and metals prices for the forecast period that was custom-designed for use in the MiHR system. Authorities contributing to this consensus include the World Bank, Bank of Canada, private sector Canadian banks and commodity-specific economic analysis consultancies.

## 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's age demographics but these were adjusted, taking into account local industry inputs.

## 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 Nipissing 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 forecasting labour markets on the district level is the fact 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 Nipissing district, or to easily travel from the 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 they be counted based upon where they contribute to the economy through spending and living, or based on where they work and contribute through an employer's spending and investment in the region? In this forecast, individuals are counted on the basis of where they live.

These challenges are unique to the analysis of a district's labour market. As a result, MiHR has adopted conservative forecast estimates 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 per cent.

### 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. 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 assumes that commodity prices are stronger than the consensus forecast (leading to increased mining activity) and that labour productivity is lower than the historic trend — providing an upper boundary for the hiring requirements forecast. Conversely, the contractionary scenario assumes commodity prices that are weaker than the consensus forecast (leading to less mining activity) and labour productivity higher than the historic trend — providing a lower boundary for the hiring requirements forecast.

In addition to model inputs, information from key informants, Statistics Canada, Natural Resources Canada and MiHR research was incorporated to develop the forecast for mining employment in the district. In particular, the baseline scenario assumes that known advanced development projects will move forward as currently 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.



## 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 (exploration, development, extraction, processing and reclamation). Similarly, there is no single set of NOC-S categories that pertain only to 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.

### Occupation Classification

Listed below are the 66 NOC-S codes that MiHR uses to define the occupations that are essential to the exploration and mining sector. Note that the occupation titles listed below are those used in the Statistics Canada system. Often an occupation can have multiple titles and Statistics Canada offers a means to map or connect job titles back to the proper NOC-S code, found on the Human Resources and Skills Development Canada website (specifically the “Quick Search” box).<sup>9</sup>

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)” includes 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
A111	Financial managers
A112	Human resources managers
A121	Engineering managers
A371	Construction managers
A381	Primary production managers (except agriculture)
B011	Financial auditors and accountants
B012	Financial and investment analysts
B021	Specialists in human resources
B211	Secretaries (except legal and medical)
B541	Administrative clerks
B573	Production clerks

<sup>9</sup> See <http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/Welcome.aspx>

B575	Dispatchers and radio operators
B576	Transportation route and crew schedulers
C012	Chemists
C013	Geologists, geochemists and geophysicists
C015	Other professional occupations in physical sciences
C021	Biologists and related scientists
C031	Civil engineers
C032	Mechanical engineers
C033	Electrical and electronics engineers
C034	Chemical engineers
C041	Industrial and manufacturing engineers
C042	Metallurgical and materials engineers
C043	Mining engineers
C044	Geological engineers
C048	Other professional engineers.
C054	Land surveyors
C111	Chemical technologists and technicians
C112	Geological and mineral technologists and technicians
C121	Biological technologists and technicians
C131	Civil engineering technologists and technicians
C132	Mechanical engineering technologists and technicians
C133	Industrial engineering and manufacturing technologists and technicians
C134	Construction estimators
C141	Electrical and electronics engineering technologists and technicians
C153	Drafting technologists and technicians
C154	Land survey technologists and technicians
C155	Mapping and related technologists and technicians
C162	Engineering inspectors and regulatory officers
C163	Inspectors in public and environmental health and occupational health and safety
G412	Cooks
H013	Contractors and supervisors, pipefitting trades
H016	Contractors and supervisors, mechanic trades
H111	Plumbers
H112	Steamfitters, pipefitters and sprinkler system installers
H121	Carpenters
H212	Industrial electricians
H326	Welders and related machine operators
H411	Construction millwrights and industrial mechanics (except textile)
H412	Heavy-duty equipment mechanics
H611	Heavy equipment operators (except crane)
H621	Crane operators
H622	Drillers and blasters — Surface mining, quarrying and construction
H711	Truck drivers
H812	Material handlers
H821	Construction trades helpers and workers
H822	Other trades helpers and workers
I121	Supervisors, mining and quarrying
I131	Underground production and development miners
I141	Underground mine service and support workers

I214	Mine workers
J011	Supervisors, mineral and metal processing
J111	Central control and process operators, mineral and metal processing
J121	Machine operators, mineral and metal processing
J125	Inspectors and testers, mineral and metal processing
J311	Workers in mineral and metal processing





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