MINING YEAR IN REVIEW

NATIONAL OUTLOOK
2021

MINING INDUSTRY
HUMAN RESOURCES COUNCIL

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Published March 2021

Canada

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Source: Iron Ore Company of Canada

CHAPTER ONE:
THE COVID-19 PANDEMIC

2020: A TURBULENT AND TRANSFORMATIVE YEAR

The COVID-19 pandemic has dramatically changed the world since gaining momentum in early 2020, causing substantial loss of life and affecting livelihoods, economies and industries across the globe.

In the years leading up to 2020, Canada's mining industry enjoyed a period of relative stability in several leading indicators. The emergence of COVID-19 in early 2020 triggered an initial economic shock that has rippled through all sectors of the world economy. Like other industries, the Canadian mining industry was caught off guard, which forced several mining operations across the country to interrupt their regular day-to-day activities.

COVID-19 continues to unfold, and hence it will take several years of hindsight before we can fully appreciate the pandemic's impact on the mining sector. Nevertheless, this chapter provides a sense of the key impacts, including the changes in employment, unemployment, education and wages. Data align with the *North American Industry Classification System (NAICS)* to define the mining industry in Canada, with the primary focus on *Mining and quarrying (NAICS 212).*

MiHR's analysis establishes a precise timeline spanning six distinct phases, from Q1 2019 through all of 2020 and the start of Q1 2021 (Figure 1).

Figure 1: Distinct Phases of the COVID-19 Timeline (Q4 2019 to Q1 2021)
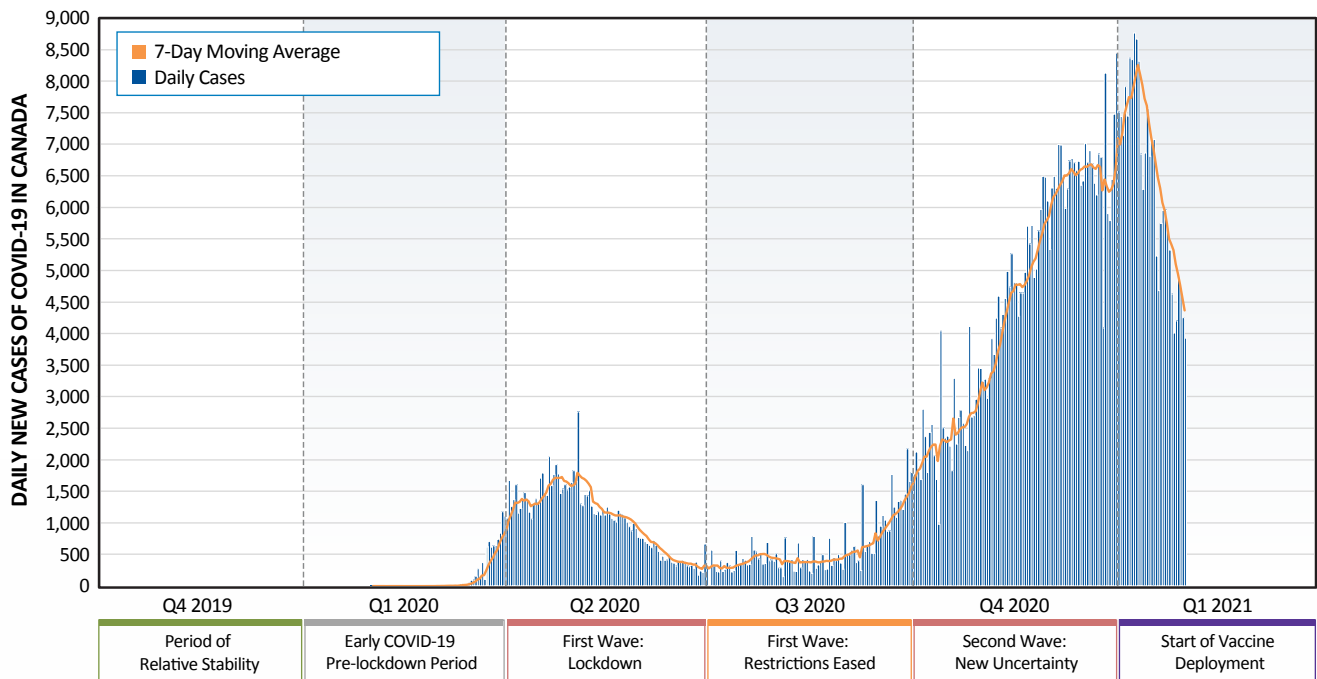
Source: Mining Industry Human Resources Council (2021); Government of Canada Public Health Infobase.

A PROLONGED EMPLOYMENT RECOVERY

The pre-pandemic mining labour market showed stable vital signs. According to the Labour Force Survey (LFS), employment levels in *Mining and quarrying (NAICS 212)* had been relatively steady heading into the early pre-lockdown period of Q1 2020. However, after the initial shock, employment in the sector fell by roughly 11% in April (Figure 2).

Compared to other industries, this drop in employment was relatively middle-of-the-road. For instance, employment losses in *Accommodation services (NAICS 721)* and *Food services and drinking places (NAICS 722)* fell by roughly 33% and 34% respectively. The mining sector was better able to adapt to the crisis than other sectors as provincial governments, early on, deemed that mining operations were an essential service.

The mining sector downturn in 2020 was less dramatic compared to other sectors, but the recovery has been somewhat prolonged. Compared to previous years, employment levels have stagnated, especially where seasonality has historically favoured an employment boost in the summer months (Figure 2).

Figure 2: Employment in *Mining and quarrying (NAICS 212)* (Jan 2017 to Dec 2020)
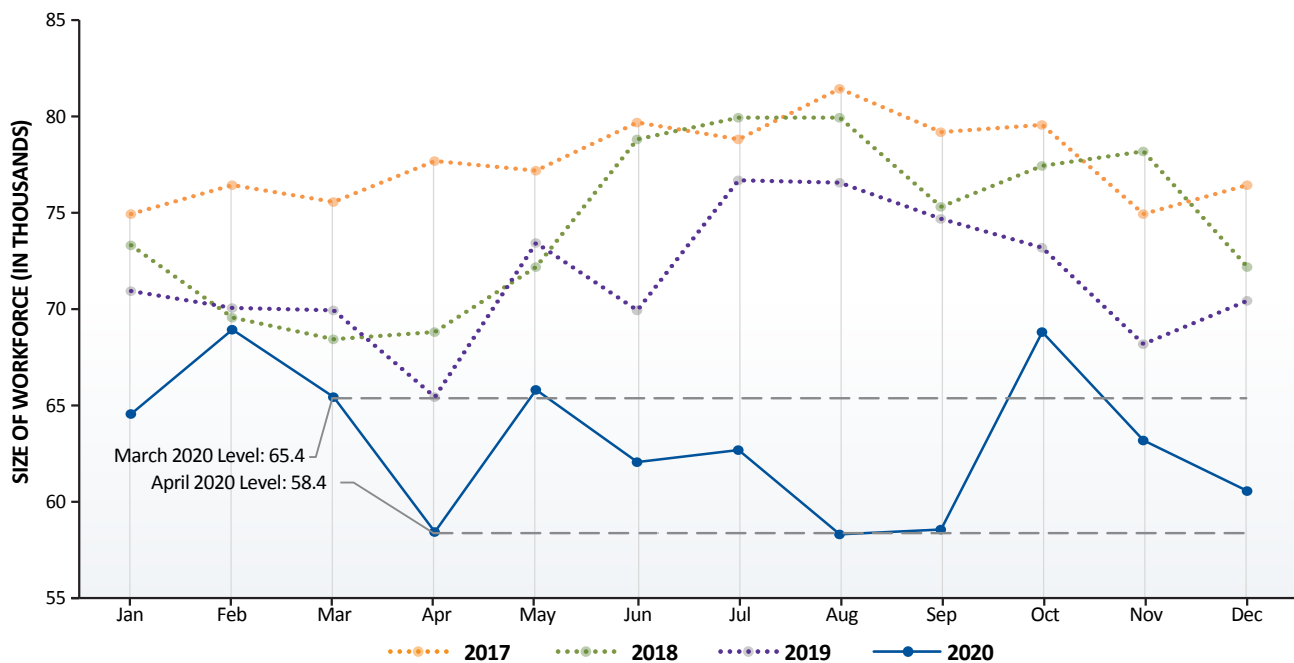
Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).

UNEMPLOYMENT SPIKES DURING FIRST LOCKDOWN

Prior to the March 2020 lockdown, the unemployment rate in *Mining and quarrying (NAICS 212)* was relatively low, at around 3.3% (Figure 3), compared to the estimated average of 3.7% over the previous five years. However, the April data point reveals a large spike in unemployment (to 17.9%) as a direct result of lockdown measures, marking the largest unemployment rate in Labour Force Survey records dating back to 1987.

Following the April 2020 spike, the unemployment rate in *Mining and quarrying (NAICS 212)* quickly recovered to pre-COVID levels (back to 4.5% in June) and appeared to stabilize in that range through the summer and fall months (Figure 3). However, the year ended with a resurgence to 9.7% unemployment as of December 2020.

Though *Mining and quarrying (NAICS 212)* experienced unprecedented unemployment rates at certain stages of 2020, this problem was less persistent relative to other sectors. For instance, according to LFS data, the unemployment rate in *Air transportation (NAICS 481)* increased from 1% in March to 23% in April and remained elevated at 26% as of December 2020. In *Accommodation services (NAICS 721)*, the rate increased from 10% in February to 20% in March, rose to 35% in April, and remained at 27% as of December 2020.

Figure 3: Unemployment Rate in *Mining and quarrying (NAICS 212)* (Jan 2017 to Dec 2020)
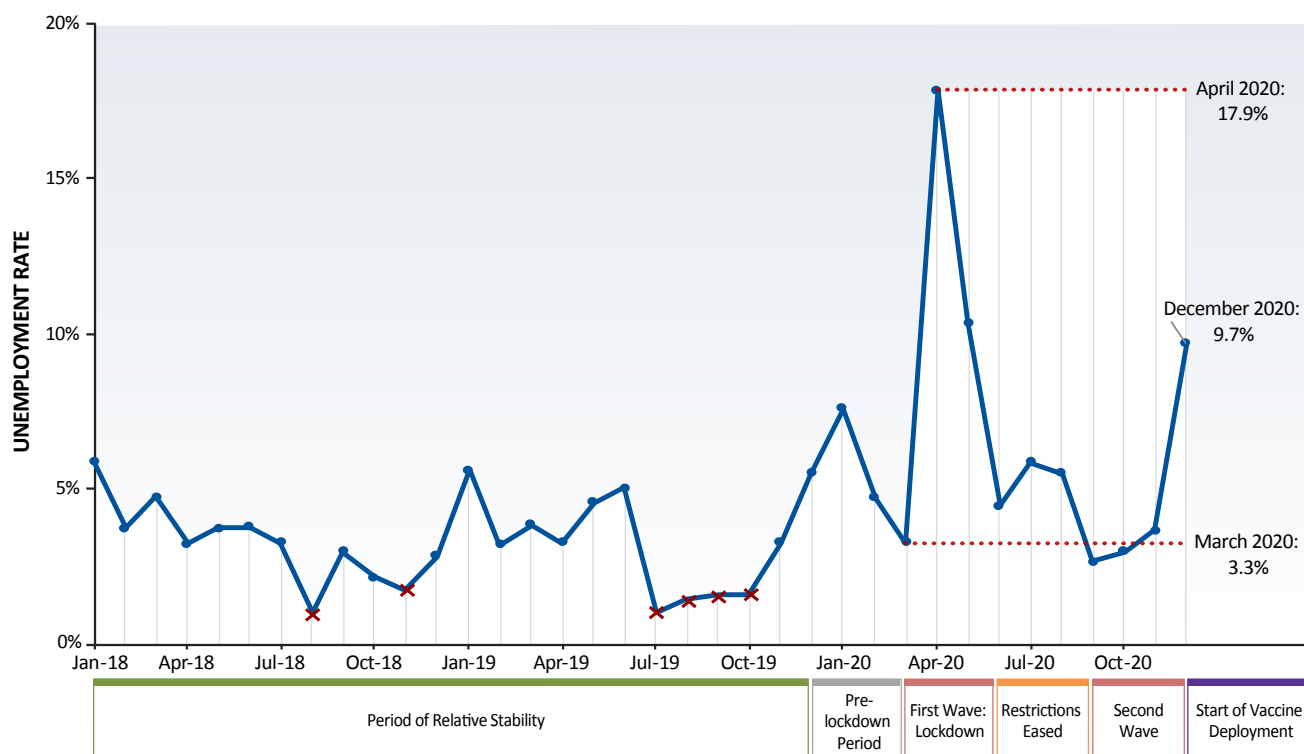
Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).
Note that certain data points were derived due to data suppression. A red x denotes an estimate.

MINING-RELATED SUB-SECTORS AFFECTED DIFFERENTLY

Different segments of Canada's mining industry have fared worse than others through the pandemic. In its ongoing analysis, MiHR typically monitors four main sub-sectors that correspond to various industry (three-digit NAICS) codes (Table 1). Although they may not be as mining-centric as *Mining and quarrying (NAICS 212)*, consideration of these industry codes offers a more complete picture of the state of mining in Canada.

Following the first wave of the pandemic (from Q1 to Q2 of 2020), the average employment change across 103 sectors (three-digit NAICS codes) of the Canadian economy was -9%, while the average unemployment rate increase was +6%. *Mining and quarrying (NAICS 212)* fell in the middle of the spectrum, both in terms of employment loss (-6%) and the unemployment rate spike (+6%) resulting from the first wave of the pandemic (Figure 4).

Table 1: Key Sub-Sectors Relevant to Canada's Mining Industry, by three-Digit NAICS Code

MiHR Sub-Sectors	Description	Relevant industry code shown in this report
EXTRACTION AND MILLING	Describes the activities at operating mines across Canada, including both surface and underground mining operations, and on-site processing activities.	**NAICS 212:** Mining and quarrying (except oil and gas) **NAICS 211:** Oil and gas extraction *relevant to oil-sands mining*
SUPPORT SERVICES	Includes the activities of organizations providing support services for a wide range of mining activities, often on a contract or fee basis.	**NAICS 213:** Support activities for mining, and oil and gas extraction
PRIMARY METAL MANUFACTURING	Consists of activities that are directly downstream from extraction and milling, including smelting and refining of ferrous and non-ferrous metals.	**NAICS 331:** Primary metal manufacturing
EXPLORATION	Encompasses activities focused on the discovery of minerals and metals.	**NAICS 541:** Professional, scientific and technical services

Source: Mining Industry Human Resources Council (2021); Statistics Canada.

UNEMPLOYMENT RATE

Total, all industries

Mining and quarrying (except oil and gas) (NOC 212)

Support activities for mining, and oil and gas extraction (NOC 213)

Oil and gas extraction (NOC 211)

Primary metal manufacturing (NOC 331)

—— 2001 to 2019   ●— 2020   – – 2020E
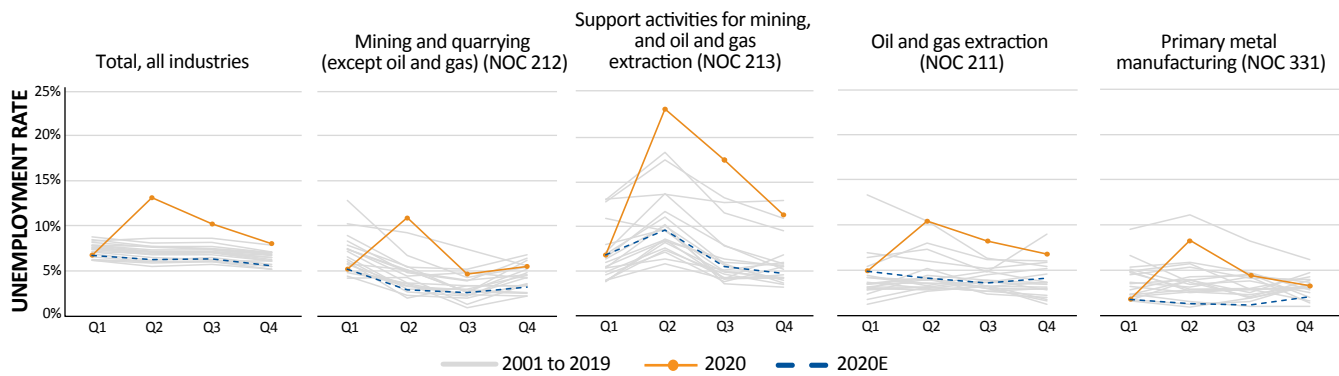
Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).
Note that certain data points were estimated due to data suppression.

In all mining-related industry codes, the COVID-19 impact on labour market trends is highly visible. For example, the unemployment rate in each sector highlights an anomalous trend in 2020 relative to the seasonal trends over the previous two decades (Figure 4). The deviations are further illustrated by comparing the actual 2020 trend (orange line) to a prediction based on historical data (blue line).[1]

Support activities for mining, and oil and gas extraction (NAICS 213)[2] stands out as the industry code that suffered the most disruption to the unemployment rate in 2020 (Figure 4).

Source: Iron Ore Company of Canada

1 Starting from the actual observation in Q1, the prediction shows the unemployment rate path had it followed historical median growth in Q2, Q3 and Q4.
2 Note that roughly 70% of *Support activities for mining, and oil and gas extraction (NAICS 213)* was from Alberta in 2020.

WORKERS WITH LOW EDUCATIONAL ATTAINMENT FARED WORSE

Within *Mining and quarrying (NAICS 212)*, those with no degree, certificate or diploma have especially felt the weight of the pandemic.

In general, workers with low educational attainment have fared worse compared to others in the mining workforce. Notably, the unemployment rate for those with no degree, certificate or diploma climbed to unparalleled levels after Q1 2020 (Figure 5). Most other education categories exhibit a similar uptick in the unemployment rate in the second quarter (during the initial lockdown phase), but all have since recovered closer to normal levels.

Source: Agnico Eagle Ltd

Figure 5: Unemployment Rate by Educational Attainment, *Mining and quarrying (NAICS 212)*, Based on Quarterly Averages (2001 to 2020)
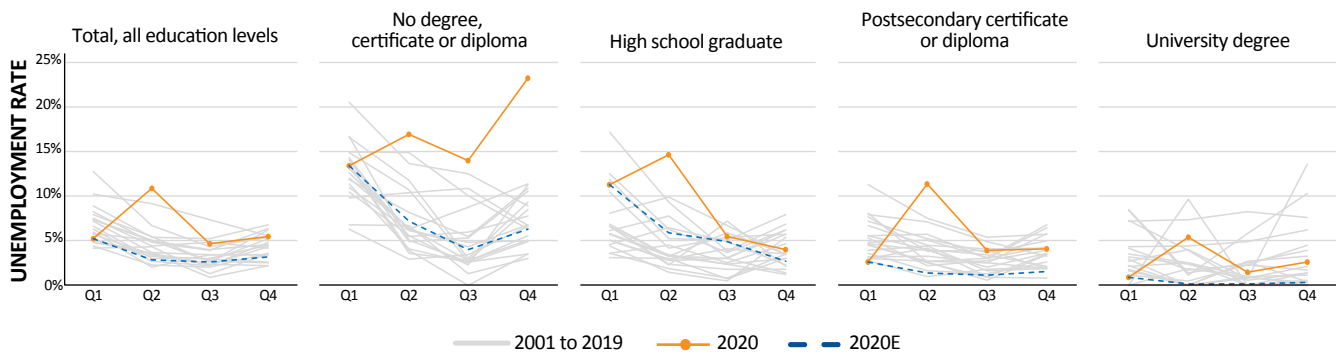
Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).
Note that certain data points were estimated due to data suppression.

COMMODITY PRICES FUEL INDUSTRY OPTIMISM

Commodity prices are one of the main drivers for production, exploration activity, and employment in the mining sector. A rise in the price of mined commodities makes production more profitable, attracting additional investment in mining projects and leading to increased mining and exploration activity.

Although the pandemic has greatly disrupted mining operations and employment, it does not appear to have adversely affected the trajectory of commodity prices, and in some instances has propelled prices upwards. Prices for precious metals gained considerable momentum through the pandemic period, and

base metals also expanded after a brief price slump at the start of the pandemic (Figure 6). The upward trend in several price movements fuelled optimism for the mining industry in 2020, even as mining companies continued to deal with the logistical disruptions of COVID-19.

On the other hand, the price of oil suffered through shifting market conditions due to COVID-19 and felt the impacts of a price war between Russia and Saudi Arabia in 2020, but to a lesser degree compared to the collapse of oil prices that occurred in the mid-2010s.

Figure 6: Indices of Metals & Minerals, Precious Metals, and Crude Oil (Jan 2010 to Dec 2020)
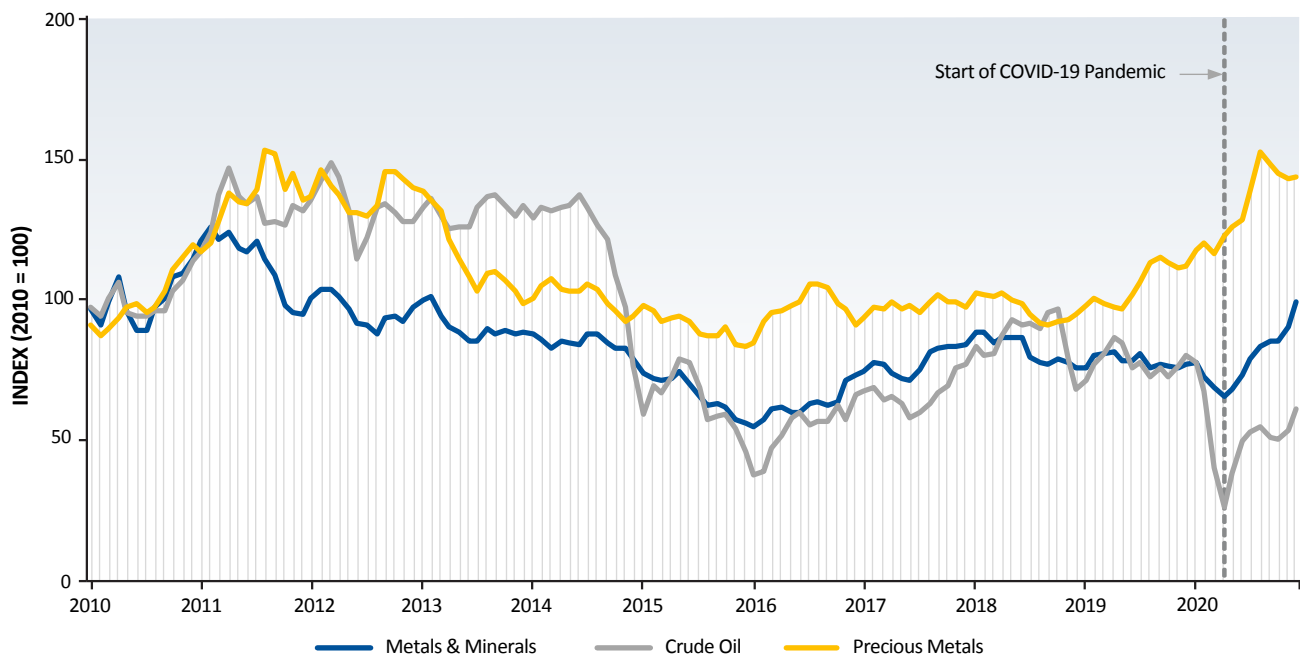
Source: Mining Industry Human Resources Council (2021); The World Bank, Commodity Prices, *"Pink Sheet"* Data, (Oct 2020).

SURVEY

Every two years, MiHR conducts a survey with mining employers to gather information on labour market trends in Canadian-based mining operations. The most current employer survey was conducted during December 2020 and January 2021. Fifteen Canadian mining companies participated in the survey, representing over 25,000 employees.

Despite the pandemic, the responses of mining companies showed signs of optimism about the future. Approximately 43% of respondents stated that their workforce would stay about the same size over the next 12 months, while 36% anticipated that their workforce would expand by up to 10%.

Figure 7: Responses to MiHR's 2020 Employer Survey Question: *Over the next 12 months do you anticipate your Canadian workforce will:*
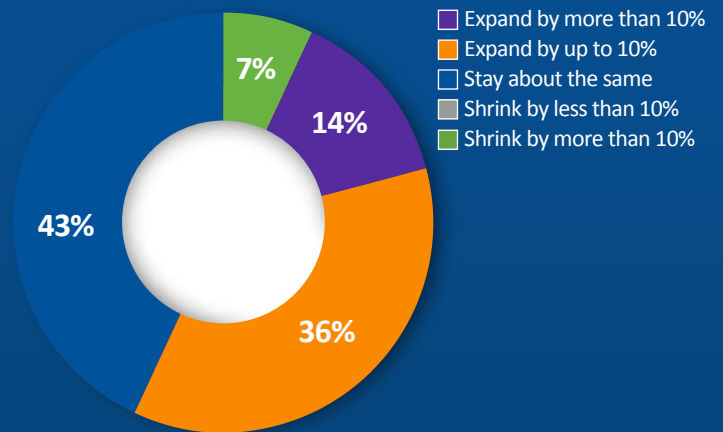
Legend:
- Expand by more than 10%
- Expand by up to 10%
- Stay about the same
- Shrink by less than 10%
- Shrink by more than 10%

7%
14%
43%
36%

Source: Mining Industry Human Resources Council, 2020 Employer Survey (2021). The survey was conducted during December 2020 and January 2021. Fifteen Canadian mining companies participated in the survey, representing over 25,000 employees.

CHAPTER TWO:
A PROFILE OF THE MINING WORKFORCE

This chapter investigates the demographic, regional and educational characteristics that describe Canada's mining workforce. The analysis provides a picture of how different groupings are represented in the mining sector and points to key trends related to mining sub-sectors, geographical regions, educational attainment categories and demographic cohorts over the past few years.

SUBDUED DOWNTREND IN MINING AND QUARRYING EMPLOYMENT

Over the past five years, employment in *Mining and quarrying (NAICS 212)* has slightly contracted, experiencing relatively flat employment growth prior to the pandemic (Figure 8). In contrast, other sectors have shown more dramatic up-and-down swings in employment. For instance, *Support activities for mining, and oil and gas extraction (NAICS 213)* witnessed year-over-year changes ranging from roughly -35% to +20% over the past five years; year-over-year changes in *Mining and quarrying (NAICS 212)* ranged from roughly -25% to +10% (though it only ranged from roughly -10% to +10% before the pandemic).

Figure 8: Employment (Three-Month Moving Averages) and Year-Over-Year Employment Growth by Industry Code (Jan 2016 to Dec 2020)
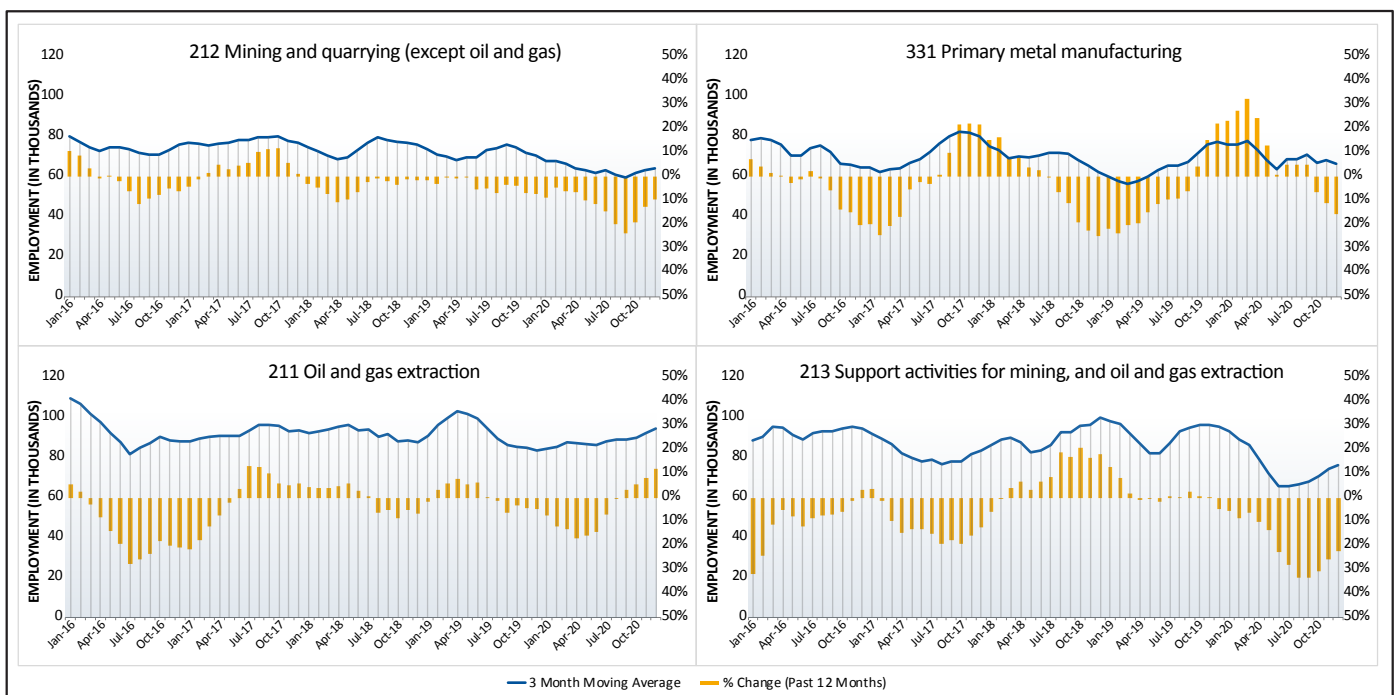
Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).

QUEBEC, ONTARIO AND BRITISH COLUMBIA LEAD IN MINING EMPLOYMENT

Canada's mining industry is spread across several distinct geographical regions. The provinces with the highest employment in *Mining and quarrying (NAICS 212)* are Quebec, Ontario and British Columbia. In 2020, these three provinces accounted for nearly 71% of employment in the sector.

Since late 2018, Quebec has led all other provinces in employment in *Mining and quarrying (NAICS 212)* (Figure 9). British Columbia has historically contended for the second largest mining workforce, but has lagged since mid-2017.

Figure 9: Employment (Three-Month Moving Averages) in *Mining and quarrying (NAICS 212)* by Province (Jan 2016 to Dec 2020)

Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).

SUSTAINED POSITIVE TREND IN POST-SECONDARY EDUCATION

Mining operations draw on people with diverse educational backgrounds. This report considers four distinct levels of educational attainment: (1) no degree, certificate or diploma, (2) high school diploma, (3) post-secondary certificate or diploma and (4) university degree.

Over the long term (since 2001), workers with a post-secondary diploma have shown the strongest upward trend in employment in *Mining and quarrying (NAICS 212)*. As of December 2020, employment in this group had increased by 50% over the previous 20 years (Figure 10). Conversely, employment levels for workers with no degree, certificate or diploma had declined by roughly 60% over the same time period.

Figure 10: Employment (Three-Month Moving Averages) in *Mining and quarrying (NAICS 212)* by Educational Attainment (Jan 2001 to Dec 2020)
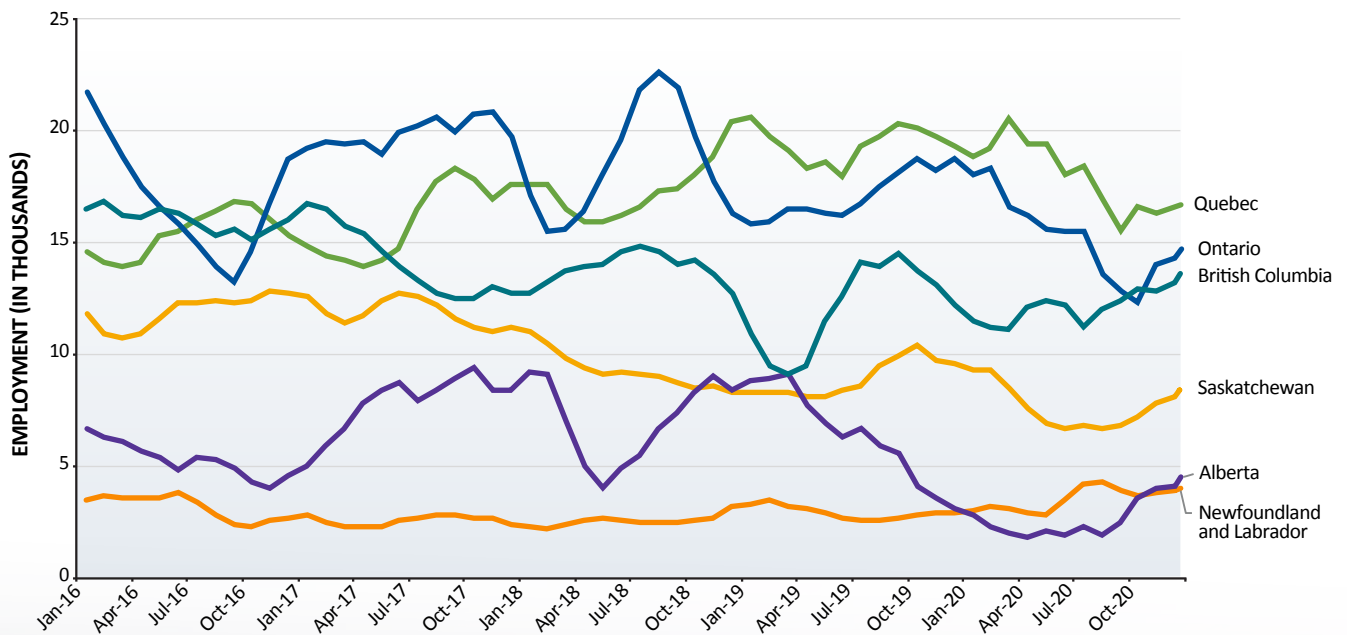

Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).
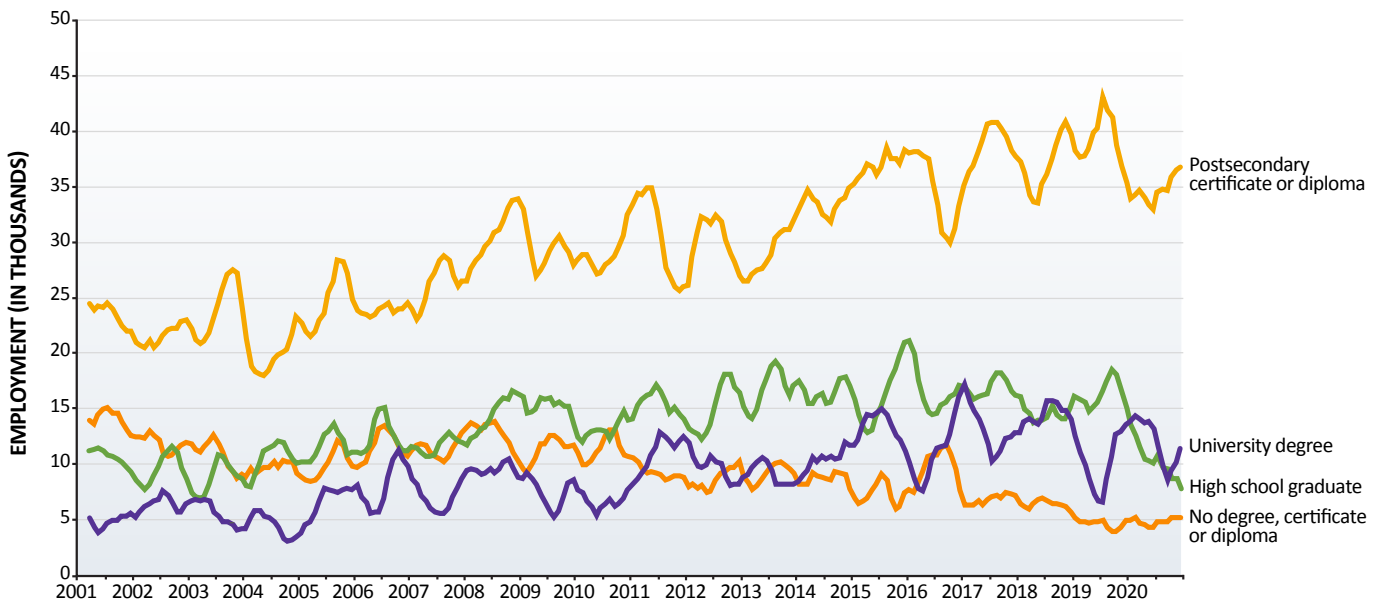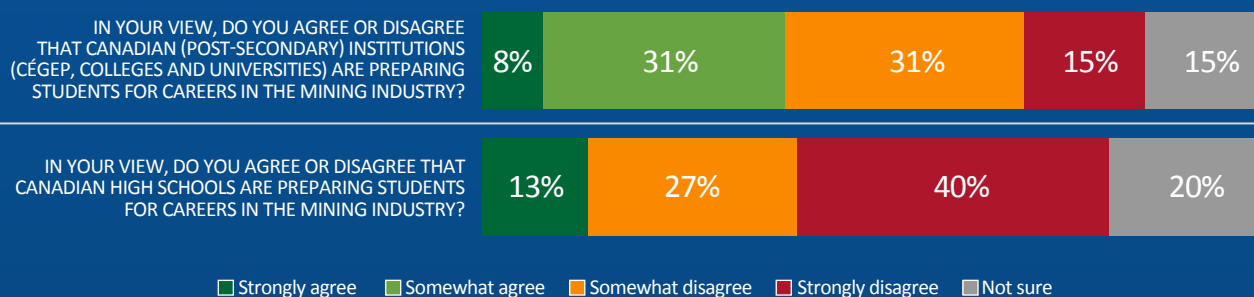
SURVEY

Mining employers stressed the importance of post-secondary education in preparing mining entrants. When asked about the preparedness of students, 39% of respondents agreed that post-secondary institutions are adequately preparing students for careers in the mining industry, while only 13% agreed that high schools were doing the same. On the other hand, 67% of respondents agreed that high school was not sufficiently preparing students for mining, while only 46% said the same of post-secondary education.
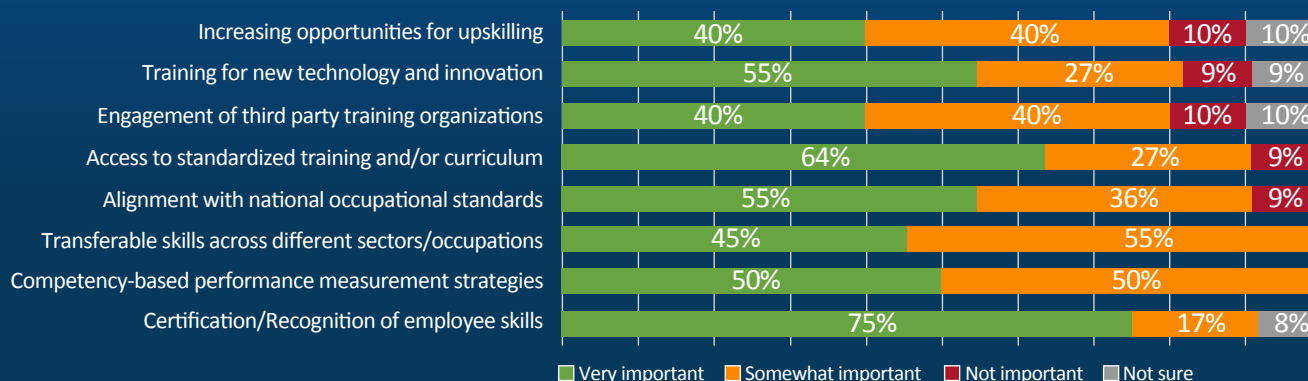
Figure 11: Responses to MiHR's Employer Survey Questions on Educational Preparedness

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	Not sure
IN YOUR VIEW, DO YOU AGREE OR DISAGREE THAT CANADIAN (POST-SECONDARY) INSTITUTIONS (CÉGEP, COLLEGES AND UNIVERSITIES) ARE PREPARING STUDENTS FOR CAREERS IN THE MINING INDUSTRY?	8%	31%	31%	15%	15%
IN YOUR VIEW, DO YOU AGREE OR DISAGREE THAT CANADIAN HIGH SCHOOLS ARE PREPARING STUDENTS FOR CAREERS IN THE MINING INDUSTRY?	13%		27%	40%	20%

□ Strongly agree □ Somewhat agree □ Somewhat disagree □ Strongly disagree □ Not sure

Source: Mining Industry Human Resources Council, 2020 Employer Survey (2021). The survey was conducted during December 2020 and January 2021. Fifteen Canadian mining companies participated in the survey, representing over 25,000 employees.

When asked about the comparative importance of their corporate training and development strategies, most of the survey respondents agreed that certification, and recognition of employee skills were very important (75%) (Figure 12). Respondents also stated that access to standardized training and/or curriculum (64%), alignment with national occupational standards (55%), training for new technology and innovation (55%), and competency-based performance measurement strategies (50%) were also very important.

Figure 12: Responses to MiHR's 2020 Employer Survey Question: *How important is the following to your organization's Canadian Training and Development strategy?*

	Very important	Somewhat important	Not important	Not sure
Increasing opportunities for upskilling	40%	40%	10%	10%
Training for new technology and innovation	55%	27%	9%	9%
Engagement of third party training organizations	40%	40%	10%	10%
Access to standardized training and/or curriculum	64%	27%	9%	
Alignment with national occupational standards	55%	36%	9%	
Transferable skills across different sectors/occupations	45%	55%		
Competency-based performance measurement strategies	50%	50%		
Certification/Recognition of employee skills	75%	17%	8%	

□ Very important □ Somewhat important □ Not important □ Not sure

Source: Mining Industry Human Resources Council, 2020 Employer Survey (2021). The survey was conducted during December 2020 and January 2021. Fifteen Canadian mining companies participated in the survey, representing over 25,000 employees.

ANTICIPATED DROUGHT IN MINING-RELATED ENGINEERING

The mining industry draws from several engineering disciplines in its operations, most notably mining, geological, and material and metallurgical engineering. Remarkably, these same three disciplines experienced the lowest undergraduate enrolment among all engineering programs in Canada from 2015 to 2019 (Figure 13).

Additionally, while enrolment in these three disciplines has clearly declined over this period, other engineering programs have experienced increased enrolments. As an example, enrolments in mining engineering undergraduate programs fell by roughly one third from 2015 to 2019, whereas enrolment in biosystems undergraduate programs rose by 73% over the same period.

As new graduates are a significant source of new labour, this enrolment downturn could signal trouble for the mining industry, limiting its ability to meet future hiring needs. The next generation of mining engineers is vital for the continued growth of the sector and having an increasingly smaller pool of graduates is likely to lead to tightness in the labour market.

Figure 13: Indices of Enrolment and Total Number of Undergraduates by Engineering Discipline (2015 to 2019)
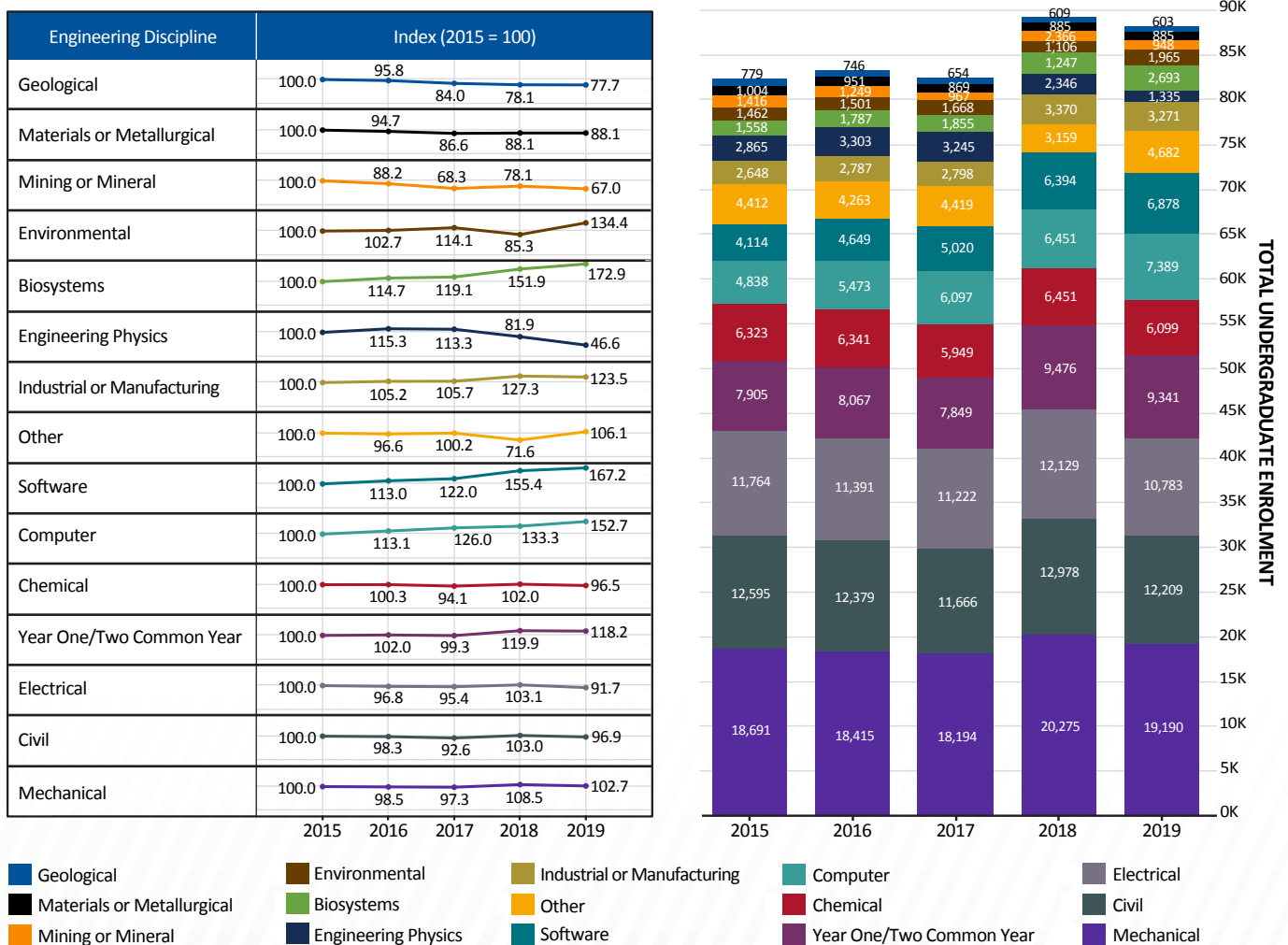
Source: Mining Industry Human Resources Council (2021); Engineers Canada, Canadian Engineers for Tomorrow—Trends in Engineering Enrolment and Degrees Awarded 2019 (2020).

# HIGHER RESILIENCE OF WOMEN IN MINING COMPARED TO OTHER INDUSTRIES

MiHR's ongoing analysis regularly monitors the labour market outcomes for a set of diverse demographic groups. Indigenous peoples, women, immigrants and various age categories are frequently among the critical groups of interest, though this list is not entirely inclusive. All of the groups face unique challenges in the mining industry.

Women in *Mining and quarrying (NAICS 212)* have continued to be under-represented over the last five years ranging between 12% and 19% of the workforce (Figure 14). As of December 2020, employment for women totaled 8,900 workers,

representing 15% of the workforce in *Mining and quarrying (NAICS 212)*. Since the emergence of the pandemic, women in the sector have shown more employment resiliency than their peers in other industries; the average unemployment rate for women in mining was 3.8% from April to December 2020, compared to 10.5% (on average) for women in all industries across Canada.

Lastly, male workers (86%) represent the majority of workers in *Mining and quarrying (NAICS 212)* and are therefore subject to the greater trends for the industry as a whole (Figure 11).

Figure 14: Employment (Three-Month Moving Averages) and Share of Employment in *Mining and quarrying (NAICS 212)* by Key Demographic Group (Jan 2016 to Dec 2020)
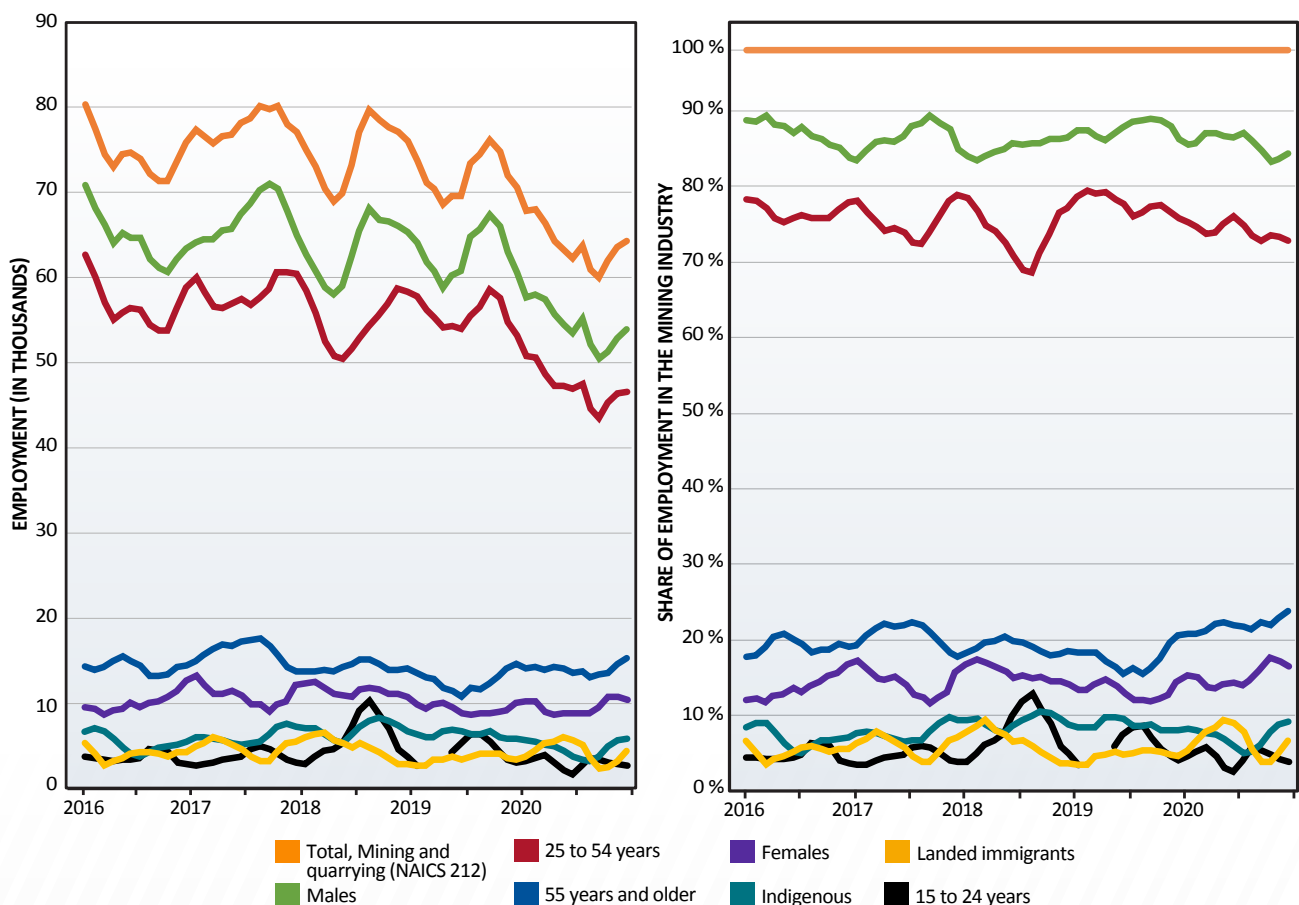
Source: Mining Industry Human Resources Council (2021); Statistics Canada, Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).

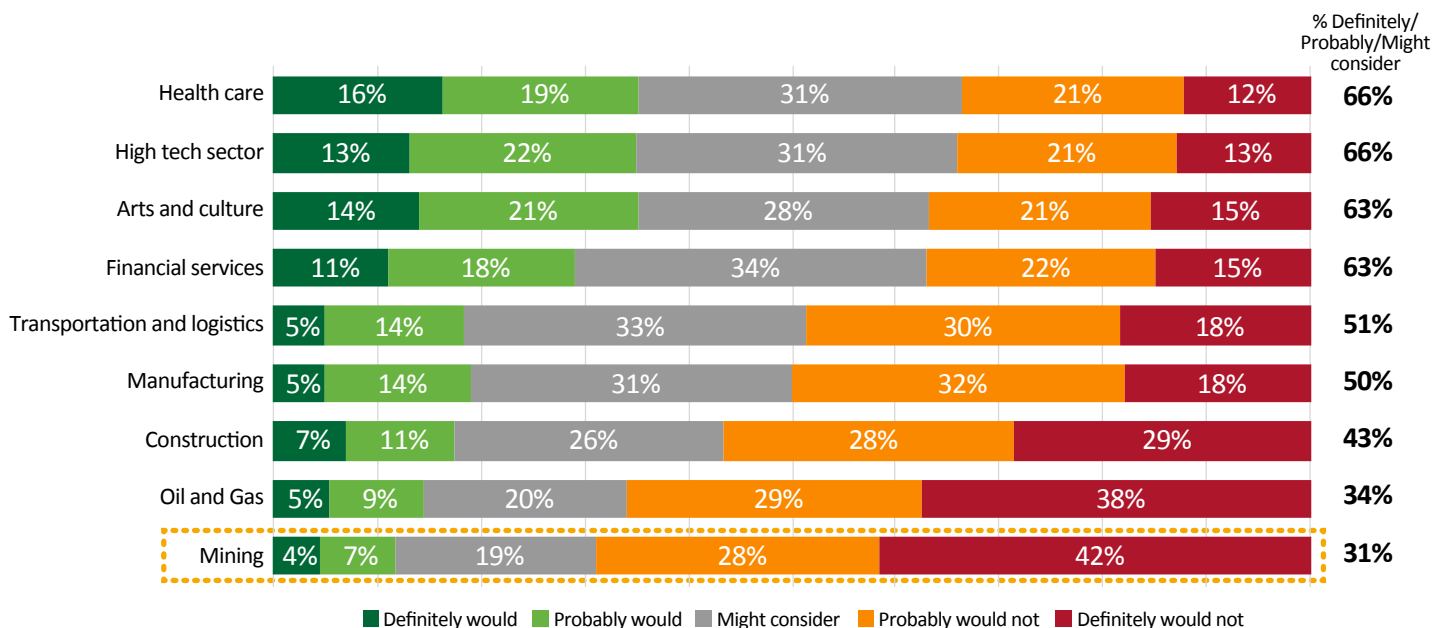# YOUTH LESS LIKELY TO CHOOSE THE MINING INDUSTRY

Prime-age workers (ages 25 to 54) and older workers (55+) collectively represent the majority of the workforce (roughly three quarters) in *Mining and quarrying (NAICS 212)*. Younger workers (ages 15 to 24) represent a more modest share of the workforce—an average of 4% of workers in 2020 (Figure 15).

A significant challenge for the mining industry is to attract younger career seekers entering the workforce. MiHR commissioned Abacus Data to conduct a survey of 3,000 Canadians aged 15 to 30, from December 2 to 14, 2020.[3]

This survey explored how youth perceive various sectors of the economy as potential career paths. When asked how likely they would consider working in nine different sectors, young people reported that mining had the least appeal: Only 31% of respondents stated they would consider working in mining; 28% stated they probably would not consider working in mining; and 42% stated they definitely would not consider working in mining.

This finding is potentially problematic for the mining industry to the extent that it may limit the size of the incoming talent pipeline and the future growth of the labour pool.

Figure 15: Responses of Young Canadians (Ages 15 to 30) to the Survey Question: *How likely, if at all, would you consider working in these sectors?* (Dec 2020)

Sector	Definitely would	Probably would	Might consider	Probably would not	Definitely would not	% Definitely/ Probably/Might consider
Health care	16%	19%	31%	21%	12%	**66%**
High tech sector	13%	22%	31%	21%	13%	**66%**
Arts and culture	14%	21%	28%	21%	15%	**63%**
Financial services	11%	18%	34%	22%	15%	**63%**
Transportation and logistics	5%	14%	33%	30%	18%	**51%**
Manufacturing	5%	14%	31%	32%	18%	**50%**
Construction	7%	11%	26%	28%	29%	**43%**
Oil and Gas	5%	9%	20%	29%	38%	**34%**
Mining	4%	7%	19%	28%	42%	**31%**

Source: Mining Industry Human Resources Council (2021); Abacus Data (2020).
* Totals may not add up to 100 due to rounding.

CHAPTER THREE:
FORECASTING EMPLOYMENT IN A POST-COVID-19 ERA

THE LONG-TERM IMPACT IS UNCERTAIN

MiHR annually produces updated forecasts related to Canada's mining labour market, including projections for employment over a 10-year horizon. The events of COVID-19 introduced unprecedented uncertainty, making it difficult to predict the new economic realities in a post-pandemic era.

A range of factors that could materially impact the overall economy and the mining industry include:

- Permanent changes to recruitment, training, and the shift to remote work.
- Acceleration of technology and innovation in mining.
- The vaccine deployment timeline.
- Post-COVID-19 government policy (i.e., regulatory, fiscal, monetary).
- Macroeconomic conditions (i.e., consumer demand, trade, commodity prices, etc.).

This chapter presents three main employment scenarios for the next five years (2021 to 2025). Collectively, the three forecasting scenarios show the potential range for employment levels post-pandemic (Figure 16).

Note: The results should be interpreted with caution, as the underlying forecast model was developed before the pandemic and in a different economic environment. The intention of these scenarios is not to predict specific future outcomes, but to explore the degree and direction of the pandemic's influence on the Canadian mining labour market over the next five years.

Source: Vale

Figure 16: Historical and Forecasted Employment in Canada's Mining Industry, Three Scenarios (2007 to 2025)
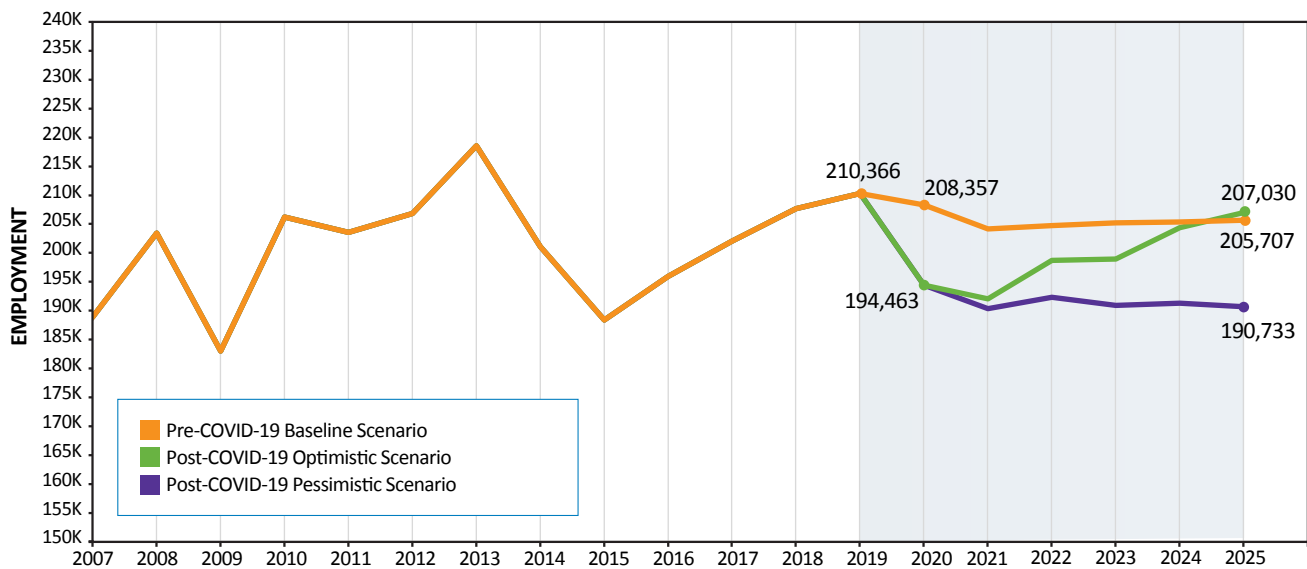
Source: Mining Industry Human Resources Council (2021); Statistics Canada, System of National Accounts (1997-2019), Census (2016), Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).

Scenario 1: MiHR's 2020 (pre-COVID-19) Baseline Employment Forecast

MiHR's previous employment forecast, developed in 2019 and published in MiHR's *2020 Canadian Mining Labour Market 10-Year Outlook*, establishes the expected path of mining employment before the pandemic.[4] This projection thus serves as a benchmark for understanding how COVID-19 has disrupted this trajectory moving forward and an indication of whether the industry is on a path to recovery and a return to 'normal'.

MiHR used an econometric model to project changes in employment over the forecast period. This model considers the movements of relevant explanatory variables such as mineral prices and exports, and observes their effects on employment. Future changes in employment are then estimated using various leading forecasts and intelligence as key explanatory variables.

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4 Note that projections for this scenario may differ slightly from MiHR's *2020 Canadian Mining Labour Market 10-Year Outlook*, as some of the 2019 data has since been updated (i.e., post-publication).

Scenario 2: MiHR's Employment Forecast with Post-COVID-19 Data—Optimistic

MiHR leveraged the 2019 model with new data inputs from 2020. The intention is to demonstrate how the introduction of new data points alters the previously forecasted employment outcomes.

The hypothesis for this scenario is that the pandemic has not fundamentally changed the underlying labour market behaviour—i.e., the labour market will respond to new forecasting inputs in a similar way as before. Therefore, this scenario assumes that COVID-19 will be a short-lived event and that employment will return to normal levels relatively quickly. Forecasting inputs (e.g., commodity price forecasts) have been revised to reflect the new post-COVID-19 economic conditions, and the 2020 employment estimate has been adjusted with newer data.

Scenario 3: MiHR's Employment Forecast with Post-COVID-19 Data—Pessimistic

MiHR leverages the existing model with new data inputs from 2020 but places more weight on reduced employment levels in 2020.

This scenario assumes that the downward shift in employment in 2020 will have a more enduring effect, and that the pandemic has set mining employment on a lower trajectory. The hypothesis for this downward shift is that the employment levels reflect a structural change in the mining workforce, a new normal for the industry. As with Scenario 2, forecasting inputs (e.g., commodity price forecasts) have been revised to reflect the new post-COVID-19 economic conditions and expectations.

Hiring Requirements: Forecasts

MiHR's forecast of hiring requirements gauges the workforce adjustments (i.e., hiring effort) required to sustain the forecasted employment levels (shown in Figure 16). The forecast considers the factors that drive recruitment decisions, namely:

a) **Net Change in Employment:** the need to expand or contract due to changes in economic conditions.

b) **Replacement Requirements:** the need to replace workers who have exited the industry.[5]

Table 2 presents industry-wide hiring requirements for the forecast period, under the three economic scenarios previously described. The projected five-year cumulative hiring requirements are as follows: 33,230 workers for the Pre-COVID-19 Baseline Scenario; 47,610 workers for the Post-COVID-19 Optimistic Scenario; and 29,720 workers for the Post-COVID-19 Pessimistic Scenario. In all scenarios, the majority of hiring requirements will come from replacing exiting workers.

Note that the forecast of hiring requirements for this 2021 report is not directly comparable to previous versions as the scenarios have been adjusted to explore the potential impact of COVID-19 and the timeframe has been shortened to five years.

Table 2: Five-Year Cumulative Hiring Requirements* by Forecast Scenario (2021 to 2025)

Scenario	Employment in 2020	Net Change in Employment	Replacement Requirements		Cumulative Five-Year Hiring Requirements
			Retirement	Non-Retirement	
Pre-COVID-19 Baseline Scenario	208,360**	-2,650	25,630	10,250	33,230
Post-COVID-19 Optimistic Scenario	194,460	+12,570	25,030	10,010	47,610
Post-COVID-19 Pessimistic Scenario	194,460	-3,730	23,890	9,560	29,720

Source: Mining Industry Human Resources Council (2021); Statistics Canada, System of National Accounts (1997-2019),
Census (2016), Labour Force Survey Custom Table, monthly, unadjusted for seasonality (2020).
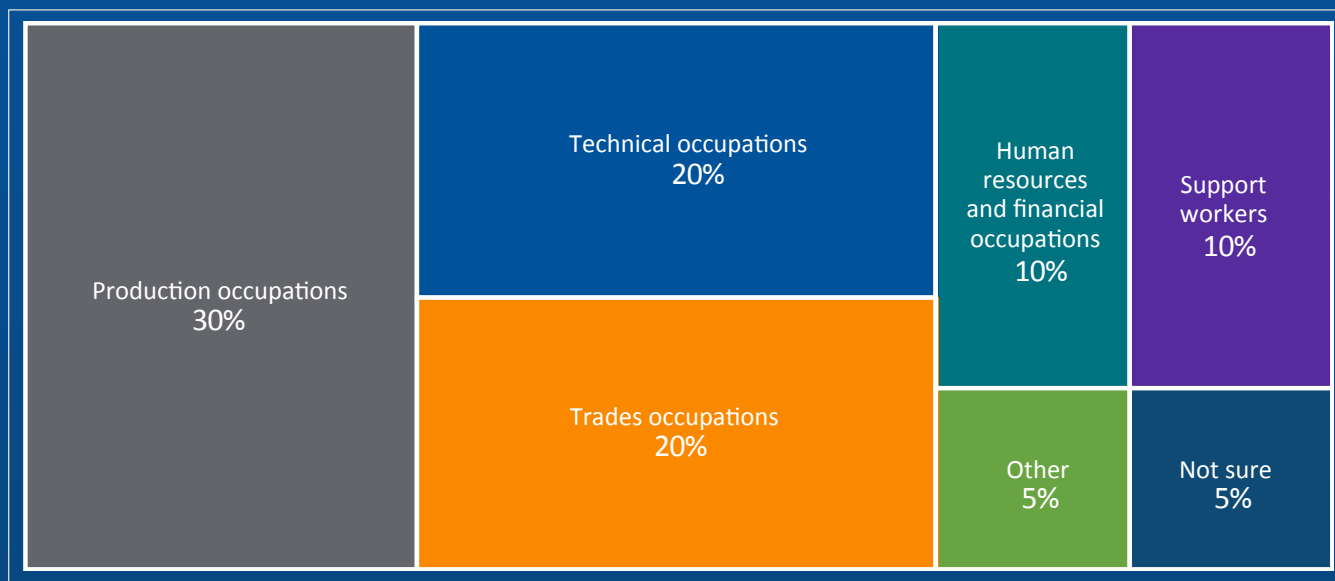* Includes Non-conventional oil extraction (NAICS 211114).
** This scenario represents the expected employment level for 2020 as determined by MiHR's forecasting model prior to the COVID-19 pandemic.

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5 For a given year, the forecast for replacement requirements conservatively assumes a yearly retirement rate of 2.5% of employment and a yearly industry exit rate of 1% of employment.

SURVEY

Mining employers who participated in MiHR's 2020 Employer Survey reported that production occupations would experience the highest staff turnover in the future, followed by technical and trades occupations (both at 20%). Human resources and financial occupations and support workers were anticipated to have less turnover (both at 10%). Retirements, the employers reported, would stay about the same from last year. Most of the employers reported that the largest future challenges they anticipated were finding qualified or skilled workers, retaining employees, and succession planning.

Figure 17: Responses to MiHR's Employer Survey Question: *Which occupational groups in your Canadian operations do you anticipate experiencing the highest staff turnover in the future?*

| Production occupations 30% | Technical occupations 20% | Human resources and financial occupations 10% | Support workers 10% |
| | Trades occupations 20% | Other 5% | Not sure 5% |

Source: Mining Industry Human Resources Council, 2020 Employer Survey (2021). The survey was conducted during December 2020 and January 2021. Fifteen Canadian mining companies participated in the survey, representing over 25,000 employees.

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