

September 2014

Progress Report

Mining Health, Safety and Prevention Review

Ministry of Labour

Ministry of Labour

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The Honourable Kevin Flynn
Minister of Labour
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Dear Minister Flynn:

In December 2013, your predecessor asked me, as Chief Prevention Officer, to undertake a comprehensive review of the health, safety and prevention issues related to underground mining in the Province of Ontario. The Mining Health, Safety and Prevention Review (Review) was launched in January 2014, and I will be submitting my final report to you in early 2015. At the beginning of this Review, I made a commitment to provide the Minister with a progress report. I am pleased to submit my progress report and some early deliverables.

Consultation has been, and continues to be critical to the success of this Review. To conduct a comprehensive assessment of current and emerging occupational health and safety issues in Ontario mines, we have sought the input, advice and expertise of the sector. An Advisory Group of industry representatives and health and safety organizations is assisting me in assessing and providing advice on a wide range of topics. In addition, with the support of the Advisory Group, I have set up Working Groups focused on the key mining health and safety issues identified for this Review. These groups are continuing their work and will make recommendations to me. Details of their work are included in an appendix to this report.

I have been very encouraged by the advice and support provided by the Advisory Group and the Working Groups, which are composed of key mining stakeholders from labour, employer and relevant health and safety organizations. The participants were invited to participate based on their demonstrated commitment to occupational health and safety in the mining sector, and their roles as recognized leaders within their professional / organizational communities. Their willingness to work together in a spirit of collaboration, mutual respect and problem-solving is integral to the success of the Review.

We have also sought broader public input through consultations and written submissions. The public consultation sessions were held in various mining communities around Ontario. Anyone was welcome to listen, participate and to share their ideas and advice to improve health and safety in the mining sector. In total, we conducted 12 public sessions across the province. Over

150 people participated, representing employers, labour, other interested parties and individuals. In addition, we have received over 60 written submissions to our public consultation document to date. An overview of what we heard can be found in this progress report.

While the final report will contain my recommendations for improving health and safety in the underground mining sector, we have identified some early deliverables and taken steps to address some key issues, such as employee visibility, training and the need for research/data to identify and understand risks and hazards.

Yours truly,

George Gritziotis

Chief Prevention Officer

Associate Deputy Minister

Acknowledgement

The work of the Review is supported by the very considerable contributions of the members of the Advisory Group. The Advisory Group members are:

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About the Mining Health, Safety and Prevention Review

Mining is a vital industry in Ontario. In 2013, the sector employed 27,000 people directly and created over 50,000 indirect jobs¹. In recent years, a variety of new mineral deposits have been found in the province, and the mining industry is expected to grow and become more complex. Miners work in artificial environments that are subject to geological forces so occupational health and safety is extremely important.

In December 2013, the Minister of Labour asked the Chief Prevention Officer to undertake a Mining Sector Health, Safety and Prevention Review (Review). The **objective** of the Review is to address the occupational health and safety needs of the mining sector, focusing first on underground mines. The Review's findings will help ensure those who work in mines go home safe and healthy at the end of every shift. They will also help maintain a productive, modern mining industry across our province.

The Review will:

- assess current and emerging occupational health and safety issues in the mining sector
- describe the state of health and safety in Ontario mines
- review past recommendations from public enquiries into mining health and safety and from Coroner's inquests into mining fatalities
- make recommendations to enhance and improve mining health and safety

Who is Involved?

To help guide the Review, the Chief Prevention Officer established a **stakeholder Advisory Group** – a small group of key mining stakeholders from labour, employer, and other relevant health and safety organizations (see Appendix A). Members were chosen for their demonstrated commitment to occupational health and safety in the mining sector, and their roles as recognized leaders within their professional / organizational communities. In addition, a representative from the MINES group (Mining Inquiry Needs Everyone's Support) was asked to join as an observer.

¹ Ontario Ministry of Northern Development and Mines, "More Progress in Mining Act Modernization", 2012.

What is the Focus of the Review's Work?

At its first meeting (January 28, 2014), the Advisory Group identified six key health and safety issues or themes to be explored:

1. The ability of the occupational health and safety system to meet the needs of the mining sector
2. New technology and using change management and risk assessment processes to evaluate its implications for health and safety
3. The Internal Responsibility System²
4. Training, skills and labour supply issues
5. Health and safety hazards
6. Emergency preparedness

To address these issues, the Review established six stakeholder Working Groups, made up of labour and employer representatives and coordinated by a representative from the Ministry of Labour, the Ministry of Northern Development and Mines, Workplace Safety North or the research community. Each group was provided with all the recommendations from previous inquiries and inquests related to its issue as well as all other information such as feedback from the public consultation process that may help them in their work. The Working Groups also have a resource group of subject matter experts who provide information on an as-needed basis. The Working Groups will provide recommendations to the Chief Prevention Officer in the fall of 2014. For a more detailed description of each Working Group, see Appendix B.

Consulting with the Public

To ensure the Review takes into account all views on mining health, safety and prevention, a total of 12 public consultation sessions in six Ontario communities were held: Timmins, Kirkland Lake and Sudbury during the week of March 31st, 2014, Red Lake and Marathon during the week of April 28th, 2014, and London on May 13th 2014. People who wanted to make a formal presentation to the Advisory Group were asked to register before the session began, but walk in presenters were accommodated as well. All the sessions except the first one in Timmins included at least one presentation. Over 150 people participated in the public sessions.

² The Internal Responsibility System was described by the Tony Dean Expert Advisory Panel report by referring to the work of Dr. James Ham, and his thoughts on the IRS "...the workplace parties — CEOs, unions, employers, workers and supervisors — play a significant role in promoting workplace health and safety. He emphasized that the role of each of these parties is proportional to the degree of control they exercise in the workplace."

In addition to the formal presentations, people were invited to make comments at the sessions, which were recorded but not attributed to an individual. Summaries of the comments were organized by the six issues (listed above) and shared with the appropriate Working Group.

Ontarians were also invited to make written submissions. Between May 31 to June 15, 2014, the Review posted a consultation paper and slides on the Ministry of Labour website and invited Ontarians to comment in writing. Over 60 written submissions were reviewed and ideas, organized by the six issue areas, were shared with the Advisory Group and the appropriate Working Group.

The Review's work is coordinated by a secretariat in the Ministry of Labour in consultation with mining stakeholders, particularly labour and employers and occupational health and safety practitioners.

Why a Progress Report?

The Review began in January 2014 and will conclude in early 2015. To keep people informed of its progress, the Chief Prevention Officer prepared this report, which:

- provides a profile of Ontario's underground mining industry
- summarizes the key issues identified to date through the consultations and review
- describes the results of the Ministry of Labour's Hazard and Risk Identification initiative for the mining sector
- outlines the regulatory environment
- highlights steps already taken (early deliverables) to improve health and safety
- describes in more detail the tasks of each Working Group

I. Profile of Ontario's Mining Sector

Ontario's mining industry is highly diverse and comprises both underground and surface operations as well as processing plants. It also includes sand and gravel operations and mineral exploration sites. Companies mine a wide range of mineral commodities, including gold, nickel, copper, salt, diamonds and a number of structural building materials. In 2013, Ontario's mining industry employed over 27,000 people directly, and created over 50,000 indirect jobs in the province through its supply chains and support activities. The average weekly wage paid in the mining sector in 2011 was almost 60% more than the Ontario average industrial wage, while wages paid in the mining support sector were almost 95% higher.³

Underground mines account for the majority of direct and indirect jobs in the mining sector. Currently 38 mines are in operation with another eight expected to be opened in the next decade⁴. The opening of a new mine generates approximately \$22 million in Gross Domestic Product. In addition, on average a mine creates 300 direct jobs and over 2200 indirect jobs⁵. Northern Ontario has the bulk of underground mines and the resultant economic impact.

Employment from mining at large is spread across the province but concentrated in northern Ontario. In recent years, the province has seen major opportunities emerge in the "Ring of Fire" region in the Far North. A variety of mineral deposits have been found, including chromite, which is a critical ingredient in stainless steel and otherwise unobtainable in North America.

A Growing and Changing Industry

Supported by rising global commodity demand in recent years, Ontario has seen strong growth in the mining sector. Since 2009, real Gross Domestic Product (GDP) in the mining sector increased at an average annual pace of 5.7 per cent – much stronger than the 1.2 per cent pace real GDP growth in the wider economy.⁶

The outlook for Ontario's mining sector is very robust. In its survey of available private sector forecasts, the Ontario Ministry of Finance found a range of views with the majority anticipating increased output from the mining sector. Over the next five years, it is anticipated there will be more new mine start-ups than existing mine closures, with an expected net increase of eight mines. There is also predicted to be an expansion of some existing mines.

³ University of Toronto, Mining: Dynamic and Dependable for Ontario's Future. 2012.

⁴ Ministry of Northern Development and Mining. 2014

⁵ University of Toronto, Ontario Mining, A Partner in Prosperity Building. 2007.

⁶ Statistics Canada, Gross Domestic Product by Industry: Provinces and Territories, 2013

With new underground mining practices and with the continuous demand to operate as efficiently as possible, there will be more demand for new technology. With more mining operations in remote locations, there will be increased need for off-site technical support. As the underground mining industry has become more global, foreign investment and ownership in the Ontario mining sector has increased significantly. These new investments have led to an increase in new technologies and production approaches. The mining sector is now more sophisticated and complex than in the past, and this trend is likely to continue. New technologies and approaches all have implications for health and safety.

Workforce Challenges

The growth in the mining sector is occurring at a time when the workforce is aging. By 2018, approximately 50% of Ontario miners will exit the industry – more than half of these through retirement⁷. Employee losses of this scale will create large hiring requirements and training needs.⁸ Historically, Ontario’s mining industry has accounted for 14,900 new entrants into the workforce over a 10-year period – or 3 per cent of people entering the workforce⁹. However, a Mining Industry Human Resource Council (MiHR) report estimates that Ontario’s mineral sector may require up to 59,000 new employees by 2023.¹⁰ Given the new mining technologies and approaches, these employees will need different skills.

The provincial government has been working closely with industry associations, community stakeholders, the education sector, and health and safety associations to implement strategies to ensure this vital sector has the skilled employees it needs. For example, there are more education opportunities for students, more efforts to improve the industry’s image and more efforts to attract new talent to the north and retain them. Industry organizations are taking a proactive approach by educating students and teachers about the industry. Employers are also training and hiring non-traditional mining employees such as women and Indigenous people.

The long-term labour supply challenges are different for the industry as a whole than they are for regional development projects like the Ring of Fire or for specific new mines and expansions. According to the industry view, in the short term there is a global pool of talent that is meeting current employment needs; however, remote mines may find recruitment more challenging.

⁷ Mining Industry Human Resources Council, “Ontario Labour Market Demand Project”, 2009.

⁸ Mining Industry Human Resources Council, “Ontario Labour Market Demand Project”, 2009.

⁹ Mining Industry Human Resources Council, “Sudbury Hiring Requirements Forecast”, 2013.

¹⁰ Mining Industry Human Resources Council, “Sudbury Hiring Requirements Forecast”, 2013.

Given the growth in Ontario’s mining sector, its increasing complexity (i.e. deeper mines, more remote mines) and the growing reliance on relatively inexperienced employees, there will be increased demands on the occupational health and safety system.

The Review’s final report will include a more detailed analysis of these workforce challenges and their implications for new mine development and expansion.

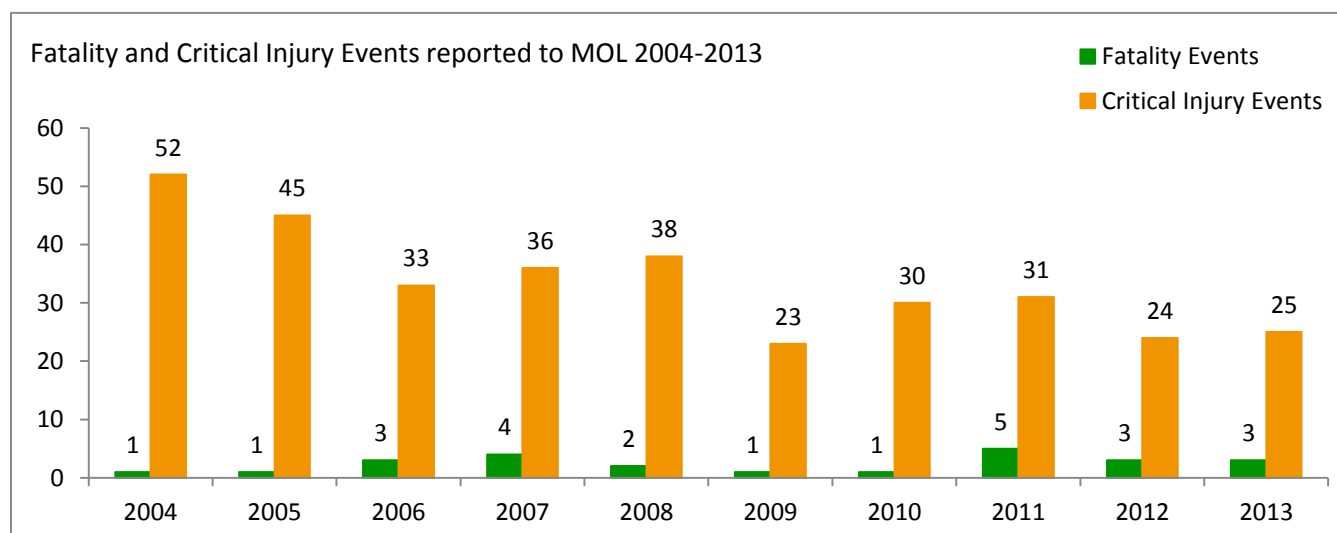
Occupational Health and Safety in Ontario’s Mining Industry

In 2013, 25 critical injuries and three traumatic fatalities were reported to the Ministry of Labour for the mining sector¹¹. Over the last 10 years, the number of critical injury events reported to the ministry has decreased. On an annual basis, the number of fatalities reported has fluctuated between one and five, and has been slightly higher in the recent past. To date in 2014, six fatalities have been reported to the Ministry of Labour.

Over the past 10 years, in the Ontario Mining sector:

- 337 critical injuries were reported to the Ministry of Labour
- 24 fatalities were reported to the Ministry of Labour
- 193 occupational disease fatality claims were allowed by the WSIB

Figure 1: Fatalities in Mining Sector Not Showing Significant Improvement



¹¹ Events include only those that have been reported to the Ministry, and may not represent what actually occurred at the workplace. A fatal injury within Ministry of Labour jurisdiction includes an injury or incident resulting in the death of an employee. This excludes death from natural causes, death of a non-employee at a workplace, suicides, death under the jurisdiction of the Criminal Code, Highway Traffic Act and Canada Labour Code and death from occupational exposures that occurred many years ago. The Ministry of Labour investigates injuries to employees covered by the Occupational Health and Safety Act. The critical injury numbers represent critical injuries reported to the Ministry, and may not necessarily represent critical injuries as defined by the Occupational Health and Safety Act. Critical injury events recorded in the ministry’s data systems may include injuries to non-employees, as workplaces are required to report these events. Data are subject to change due to inspectors’ updates to the enforcement database.

Table 1: Fatalities in Mining Sector Not Showing Significant Improvement

Year	Fatalities	Critical Injuries
2004	1	52
2005	1	45
2006	3	33
2007	4	36
2008	2	38
2009	1	23
2010	1	30
2011	5	31
2012	3	24
2013	3	25

Source: Ministry of Labour Data systems

In 2013, the Workplace Safety and Insurance Board (WSIB) allowed a total of 158 occupational disease fatality claims¹². Of these, 11 (7%) were related to the mining sector, which is roughly ten times the proportion of the insured workforce engaged in mining work¹³. Given the fact that it can take many years for an occupational disease to develop, it is important for the industry to take steps today to identify and address potential future sources of occupational disease. Prevention has the potential to save many lives.

In terms of WSIB injury claims in the mining sector, the number has declined over the past 10 years. In 2013, the mining sector had an allowed lost time injury rate of 0.79 per 100 workers, which is less than half the 2004 rate of 1.73 per 100 workers.¹⁴ This trend reflects a drop in allowed lost time injuries from 389 to 231 – despite an increase in the insurable workforce over that time period¹⁵. Throughout this period, the lost time injury rate in mining has been lower than the average of Schedule 1 employers¹⁶, and it has declined more sharply than the overall rate among Schedule 1 employers (i.e. from 1.88 to 0.95 injuries per 100 insured workers)¹⁷.

¹² Workplace Safety and Insurance Board. (2014). By The Numbers: 2013 WSIB Statistical Report, Schedule 1, pp.97 Data is at March 31st, 2014 for the entitlement year.

¹³ Based on WSIB covered employment for Schedule 1, (2104) pp 9. Data is as at March 31st of the following year for each injury/illness year.

¹⁴ Workplace Safety and Insurance Board. (2014). By The Numbers: 2013 WSIB Statistical Report, Schedule 1, pp.13 Data is at March 31st, 2014 for the entitlement year

¹⁵ Workplace Safety and Insurance Board. (2014). By The Numbers: 2013 WSIB Statistical Report, Schedule 1, pp.10-11 Data is at March 31st, 2014 for the entitlement year

¹⁶ Schedule 1 employers are required by legislation to pay premiums to the WSIB and are protected by a system of collective liability. The WSIB pays benefits to injured workers from the pooled insurance fund so Schedule 1 employers are relieved of individual responsibility for actual accident costs.

¹⁷ Workplace Safety and Insurance Board. (2014). By The Numbers: 2013 WSIB Statistical Report, Schedule 1, pp.13. Data is at March 31st, 2014 for the entitlement year

Figure 2: Allowed Lost Time Injury (LTI) Rate in Mining Sector Declined over Last 10 Years

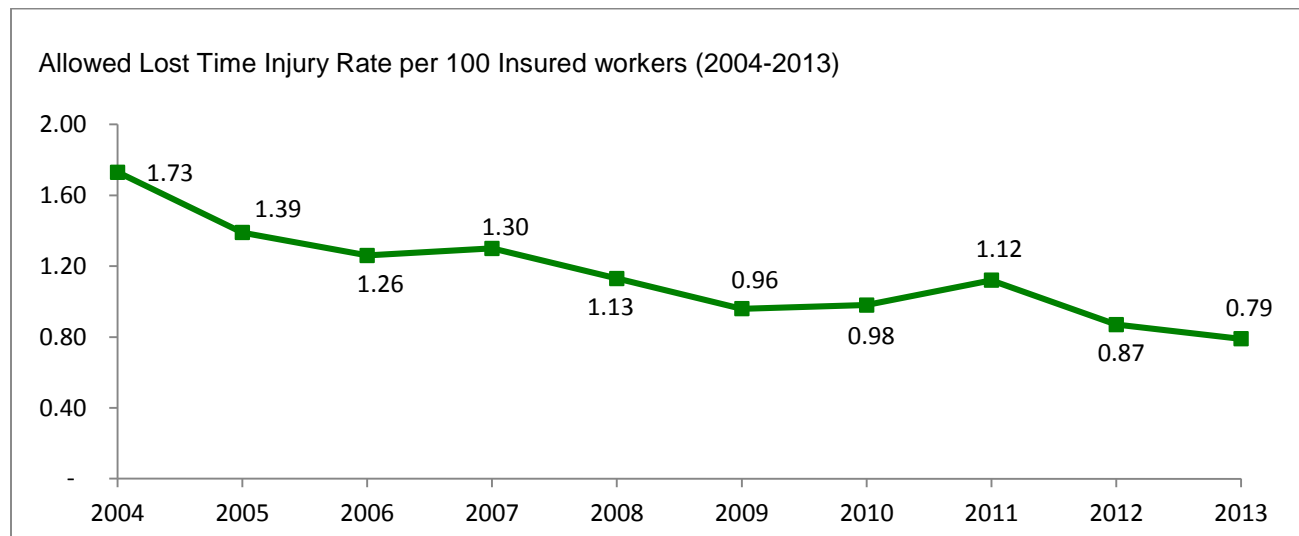


Table 2: Allowed Lost Time Injury (LTI) Rate in Mining Sector Declined over Last 10 Years

Year	LTI Rate
2004	1.73
2005	1.39
2006	1.26
2007	1.30
2008	1.13
2009	0.96
2010	0.98
2011	1.12
2012	0.87
2013	0.79

Source: WSIB (20140). By The Numbers: 2014 WSIB Statistical Report, Schedule 1. Data is as at March 31st of the following year for each injury/illness year

Joint research among the Ministry of Labour, the Institute for Work and Health, and the Centre for Spatial Economics (C4SE) highlights how important it is for the mining sector to continue to reduce allowed injury claims. Assuming the growth in mining sector employment forecasted by C4SE, if injury incidence rates remain at 2011 levels by 2022, the number of annual total injury and illness claims (lost-time and no lost-time claims) would be 1,730¹⁸. However, if injury rates

¹⁸ Calculations based on employment forecasts provided by the Centre for Spatial Economics for 2012-2022 and the allowed claim rate per 100 workers for 2011.

continue to decline consistent with the trend from 2001-2011, the number of total injury and illness claims would be 962 – or a difference of 768 compensation claims¹⁹.

Figure 3: Annual Allowed Claims for the Mining Sector

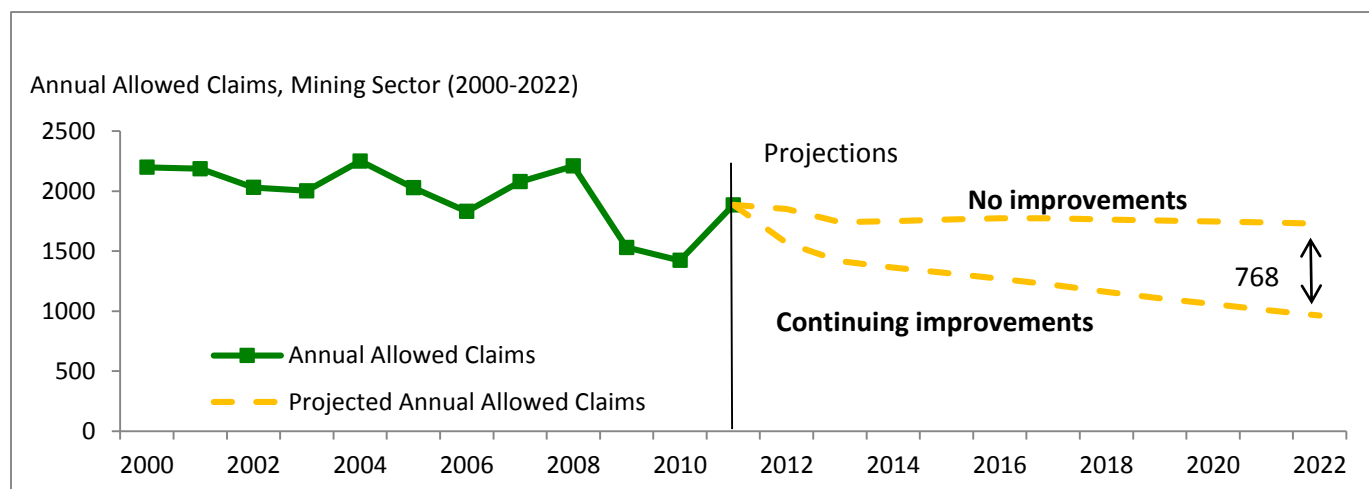


Table 3a: Annual Allowed Claims for the Mining Sector, 2000-2011

Year	Claims
2000	2199
2001	2187
2002	2031
2003	2003
2004	2251
2005	2028
2006	1831
2007	2079
2008	2209
2009	1530
2010	1422
2011	1885

Table 3b: Projected Allowed Claims for the Mining Sector in 2022

Annual Allowed Claims: No Improvements	1730
Annual Allowed Claims: Continuing Improvements	962

Source: Institute for Work and Health based on WSIB data and C4SE forecasts.

¹⁹ Claim rates were projected for 2012-2022 by the Institute for Work & Health using a log-linear method based on the claim rates for 2001-2011. Calculations used this projected claim rate and the C4SE forecasted employment.

II. Key Issues Identified to Date

During the consultation sessions, in the written submissions and in Advisory Group and Working Group meetings, the Chief Prevention Officer heard many views. Although some views differ, stakeholders share the same desired outcomes: everyone wants to make sure miners come home safe and healthy at the end of every shift.

Here is an overview of the issues identified to date. (For a more detailed description of stakeholder input, see Appendix C.)

1. At public consultations and in written submissions, the **Internal Responsibility System (IRS)** was the most-discussed topic. Stakeholders are unanimous in their view that an effective IRS is key to safe workplaces. They agree that it's important for the sector to have a common understanding of the IRS, based on the principles laid out in the Ham Commission report and that implementation in the workplace is key. However, they had different opinions about whether that common understanding or definition of the IRS should be part of the Occupational Health and Safety Act.
2. The **role of the Ministry of Labour inspector** and enforcement practices were raised in all forums.
 - a) Stakeholders generally agree that the Ministry of Labour should improve the inspectorate's technical capacity and the consistency of their enforcement action. Opinions differed on the role of the ministry inspector in the workplace. The majority thought the inspector should be a check on the system and rigorously enforce the Occupational Health and Safety Act through unannounced workplace inspections. However, some thought inspectors should play a more consultative role.
 - b) In general, stakeholders think that, as an enforcement agency, the Ministry of Labour needs more technical capacity to be able to identify the complex issues related to reducing or mitigating major mining hazards. In their view, the perceived lack of technical resources makes it difficult for the ministry to identify and resolve issues related to new technology and/or production methods or to provide the workplace with timely information.
3. While stakeholders believe that the **hazards** in the mining industry that may result in traumatic injury are well understood, they are concerned about the system's ability to ensure adequate controls are in place and being used. For example, they think there should be

effective mitigation strategies for well-known hazards such as the accumulation of water, fall of ground and risks associated with mobile equipment.

4. Stakeholders are concerned that **hazards that can result in chronic injuries** are not being managed sufficiently. They are also concerned about potential occupational health **hazards related to new technologies**. Their perception that the ministry lacks the expertise or ability to provide prompt regulatory oversight heightens these concerns.
5. All consultation sessions and many written submissions raised issues relating to **line of sight** of large equipment operators and discussed **new technologies** specifically designed to protect those who work in underground mines. Stakeholders recommended that the health and safety system make new “safety focused” technologies known to the industry. They also suggested that the health and safety system look for ways to share safety advances in one sector with others. For example, non-mining workplaces could be a source of information to improve mining safety, such as the use of high visibility garments in the construction sector.
6. Stakeholders flagged several issues that are not currently a focus for the health and safety system such as **fatigue, mental stress, and drug and alcohol use**. In their view, these issues require more research and should be a greater priority within the system.
7. In stakeholders’ view, the **Joint Health and Safety Committee (JHSC)** needs more capacity to be able to assess the adequacy of controls put in place to reduce hazards. Underground mines are unique environments that rely on complex technical measures to keep them safe. It is essential that the system find ways to provide the JHSC with the expertise to understand potential hazards and evaluate mitigation strategies. Methods to transfer information learned in the investigation of incidents would be beneficial in developing the knowledge base of JHSC members.
8. While stakeholders generally see new technology as a way to improve health and safety, they have some concerns that new technology or production methods may be introduced without employees being fully informed of why the change was made, how health and safety was considered in the process, how employees would be trained or what ongoing evaluation would be done. Some suggested that an industry best practice on **change management** could be one way to ensure employees are part of the change process and to protect employee health and safety.

9. There was almost unanimous support for the **Common Core modular training program** in the mining sector. Any concerns about the program mainly focused on the quality of program delivery rather than the content – although supervisor training was raised as one area that needs review. Some stakeholders called for the development of better standards for trainers.
10. Stakeholders praised both Workplace Safety North and the Worker’s Health and Safety Centre for the quality of their training. However the ability of Workplace Safety North to provide **timely training in smaller and remote communities** was raised as an issue.
11. Some stakeholders proposed that mining be considered a registered trade and that appropriate **apprentice programs** be developed. In their view, providing an apprenticeship program will ensure that tacit knowledge is transferred from the more experienced miner to the apprentice. However, others are strongly opposed to this idea and feel that the current Common Core serves the sector well.
12. There was across-the-board support for Ontario’s **mine rescue system**, including the current way that mine rescue is set up and operates. Despite this support, some stakeholders highlighted a need to evaluate the ability of mine rescue to respond to hazards created by new technologies and mining methods. There are some concerns about the ability to launch rescue operations as mines in Ontario get deeper and distances from the shaft increase. Some stakeholders proposed that management of mine rescue should be included in the Common Core requirement for Supervisors.
13. Families of miners fatally injured at work – as well as many other stakeholders – identified the need for a more effective **Coroner’s Inquest process**. Opinions differed on how to improve the process. Some want Coroner’s jury recommendations to be mandatory. Others want the process to include mechanisms to ensure Coroner’s jury members receive better information on mining and mining practices as well as the relevant legislation.
14. Some Advisory Group members, as well as others, suggested that the scope of the Review be expanded to also explore health and safety in **above ground mining**. Half of the fatalities in mining occur outside underground environments, so this part of the sector should not be ignored. The Review is exploring options for looking at this part of the mining sector once the underground mining review is complete.

III. Risk Assessment

As a contribution to the review and the work of the Hazard Working Group, the Ministry of Labour provided the results of a recently launched initiative that seeks to gain more insight into risks in all Ontario workplaces. The goal is to provide better information about risks to employers and their representatives, employees and their representatives, and to the Ministry of Labour and Health and Safety Associations and training providers staff – so they can work together to reduce the incidence of injury, illness and death in Ontario workplaces.

This assessment of risk in underground mining was initiated in Spring 2014. The objective was to bring together employer and labour representatives recognized as experts by their peers to identify and assess the risks, situations, conditions or factors that could lead to injury, illness or death. Over 260 factors, grouped into 29 categories, were ranked by the expert group.

Risk assessment lays the foundation for understanding and addressing the biggest challenges to preventing injury and illness in underground mining. With this risk assessment, the industry and its representatives, employees and their representatives, and the ministry and health and safety partners are in a stronger position to work together to reduce or mitigate risks to employee health and safety.

Using the ranking identified in the risk assessment initiative, along with previous recommendations from inquests, coroners recommendations, input from the public consultations and subject matter experts a list of six hazards to review in more detail has been created by the Review's Hazards working group. These six health and safety hazard themes are:

- Ground Control;
- Mobile Equipment;
- Occupational Disease and Ventilation;
- Fatigue;
- Lockout and Guarding; and
- Water Management

Both the risk assessment initiative and the consultations reinforced the high risks associated with mobile equipment, including hazards relating to poor visibility of personnel who could be struck by vehicles. As a result of this process, the Chief Prevention Officer has already put in place a best practice guideline on “High Visibility Safety Apparel for Mines and Mining Plants”.

To move the yardsticks for the system's prevention performance, it is important for all system partners to focus on the highest risks in the sector and collaborate to find mitigation strategies. To that end, the system may consider working together to systematically analyze the root causes of the top risk-ranked events. This process could help the mining sector understand the extent to which effective controls are in place to reduce the risks associated with these hazards.

IV. Regulatory Framework

The regulatory framework can be a powerful tool in health, safety and prevention. Regulation 854 (Mines and Mining Plants) under the Occupational Health and Safety Act sets out specific occupational health and safety requirements for owners, employers, supervisors and employees at mines and mining plants in Ontario. The regulation addresses health and safety issues in the mining sector, including topics such as training, fire protection, explosives, mine-hoisting plants, and electrical and mechanical equipment.

The Occupational Health and Safety Act and other regulations also set out other requirements that apply generally to all workplaces, including mines and mining plants. These include regulatory requirements regarding, for example, exposure to chemical and biological agents, confined spaces and Workplace Hazardous Materials Information.

Over the past 12 years, there have been several substantive amendments to Regulation 854, with regulatory amendment proposals moving forward typically about every three years. The most recent of these changes came into force on January 1, 2012 and included, among others, updated requirements relating to exposure to diesel exhaust and the introduction of noise reduction requirements.

Amendments to the regulation are often based on recommendations that the Minister of Labour receives from the Mining Legislative Review Committee (MLRC). The MLRC is a committee established under Section 21 of OHS Act to advise the Minister on occupational health and safety issues specific to the mining industry. It includes representatives from both labour and management, and is facilitated by ministry staff. The MLRC meets regularly throughout the year and may make consensus-based recommendations to the Minister regarding occupational health and safety issues that affect the mining industry.

The MLRC also has sub-committees that focus on particular hazards, such as electrical, hoisting and diesel. These sub-committees assist in developing recommendations for proposed amendments to the regulation, especially where the changes are technical. Although the Ministry of Labour is responsible for developing any legislative or regulatory amendments, the ministry values the continued contributions and expertise of MLRC members and considers any consensus-based recommendations made by the MLRC when contemplating amendments to the regulation.

In the fall of 2014, the ministry is considering and preparing to consult with stakeholders on a number of potential amendments to Regulation 854, some of which arose from consensus-

based recommendations made by the MLRC and others that were identified by government to keep regulatory requirements current. Examples of the issues that may be examined are: possible changes to electrical provisions, conveyor guarding and hoisting requirements, and references in the regulation to certain standards, legislation or agencies that it may require updating. Consideration of these proposed changes now – even as work on the Mining Review continues – will help ensure ongoing progress in keeping the regulation current and respond to issues already identified by stakeholders through the MLRC.

The feedback that the Chief Prevention Officer received from stakeholders during the Mining Review consultations, as well as the recommendations from the various working groups, will help inform the role of the regulatory framework in the mining sector and may identify other regulatory amendments that could also be considered, such as those related to new or emerging technologies or processes or to a particular hazard. For example, one issue that has already been identified is the current requirement regarding high visibility safety apparel. While the ministry has developed a best practice guideline to help stakeholders comply with the current requirements, it may consider proposing possible regulations to align with the Canadian Standards Association (CSA) ongoing review of its standard.

Ideas gathered through the consultations and the ongoing work of the Review will also help the ministry continue to work with the MLRC and stakeholders to keep Regulation 854 current and ensure it reflects the needs of all workplace parties in the mining sector.

V. Early Deliverables

During the process of the review, the Chief Prevention Officer continues to take steps to enhance health, safety and prevention in the mining sector. Over the past few months, the Ministry of Labour has undertaken three key initiatives.

1. Guidance on High Visibility Apparel Guidance

Operators of heavy mobile equipment have restricted lines of sight. Four Coroners' reports cited poor visibility of employees as a factor in fatalities. According to a number of academic studies, strategic placement of retro reflective material on work coveralls can significantly increase visibility.

In response to concerns expressed during the public consultations, Advisory Committee discussions of the hazards related to low-light and employee visibility in underground mining environments, and the scientific evidence, the ministry developed a business case to support the introduction of employee apparel with greater visibility features.

To help workplace parties increase the visibility of employees, the ministry has developed a best practice guideline on high visibility apparel, which will be released in late summer 2014. In addition, the Review will explore options for increasing the standards for required high visibility apparel.

2. Joint Health and Safety Committee Certification Part II

On May 7, 2014, the Ministry of Labour publicly released the 2014 Joint Health and Safety Committee (JHSC) Certification Training Program and Provider Standards. Implementation focus groups have been established to develop sector-specific hazard lists and administrative frameworks to facilitate roll-out of the new Standards. Under the 2014 Standards, Part II training, which will include training on a minimum of six hazards, will be sector-specific and require approved training programs taken from approved training providers.

In support of the JHSC Part II, the advice and recommendations from the Review's Hazard Working Group will be leveraged to help the training focus on key hazards in the mining sector. Strategies for enforcement and prevention activities, such as training and guidance information, will be developed for the hazards identified. In addition, the hazard or risk ranking will be used to select the hazards that should be on the list when implementing Part II certification training for joint health and safety committee members.

3. Mining Research

To support the Review, the Chief Prevention Officer initiated two projects to increase health and safety knowledge in the mining sector.

The first is the creation of an **Ontario Mining Exposure Database**. The Occupational Cancer Research Centre will develop this database, which will be used to: inform the development of mining sector prevention interventions; predict the future burden of disease among mining employees; and determine achievable safe levels of exposure for specific hazards.

The second project is on the impact of **vibration**. Laurentian University will evaluate the potential benefits of personal protective equipment in reducing foot-transmitted vibration for operators of underground mining equipment.

VI. Next Steps

Over the remaining time of the Review, the **Advisory Group** will continue to meet and receive updates on the working groups and provide strategic guidance on how to proceed. The Advisory Group will also review and provide advice on the final report.

The **Working Groups** will continue to work on the deliverables in their terms of reference (See Appendix B).

In addition to providing support to the Review, the Ministry of Labour and its system partners will be considering possible approaches to the issues identified to date. For example, they can begin to address issues, such as the consistency of enforcement by inspectors and the availability of training in remote communities, before the end of the Review.

Appendix A - Advisory Group

The Chief Prevention Officer established an Advisory Group to provide stakeholder advice on identifying issues, developing solutions / products / tools, and providing feedback on the progress and final reports. The Advisory Group is comprised of key mining stakeholders from labour, employer, and other relevant health and safety organizations. Members were invited based on their demonstrated commitment to occupational health and safety in the mining sector, and their roles as recognized leaders within their professional / organizational communities. A representative from the MINES group (Mining Inquiry Needs Everyone's Support) is also participating as an observer.

The Chief Prevention Officer seeks the advice of the Advisory Group on a variety of matters including past recommendations from mining sector Coroners' jury inquests and from the Ham, Burkett, and Stevenson Commissions, as well as current issues of concern and their impacts on workplace health and safety. The Advisory Group also considers other issues raised during public consultations.

Appendix B - Working Groups

Representatives of the Advisory Group recommended individuals representing both labour and employers to be part of six Working Groups created to explore the following topics:

Working Group 1: The ability of the occupational health and safety system to meet the needs of the mining sector.

Working Group 1 Facilitator: Bob Barclay – Provincial Coordinator, MHSP, MOL

Working Group 1 Members:

- Fred St. Jean – Manager Safety, Occupational Health and Medicine, Vale, Sudbury (OMA)
- Alfred Mills – USW Local 9422 (Labour Representative)

Working Group 2: New technology and the application of the change management and risk assessment processes to evaluate its associated health and safety implications.

Working Group 2 Facilitator: Vic Pakalnis – President and CEO, MIRARCO

Working Group 2 Members:

- Robert Bianchin – Safety Specialist, Glencore, Sudbury (OMA)
- Craig Allair – USW Local 6500 (Labour Representative)

Working Group 3: The Internal Responsibility System.

Working Group 3 Facilitator: Dwayne Plamondon – Director - Mining, WSN

Working Group 3 Members:

- Shannon Campbell – Manager, Mine Operations, Glencore, Timmins (OMA)
- Nancy Hutchison – Secretary-Treasurer, Ontario Federation of Labour (Labour Representative)

Working Group 4: Training, skills and labour supply issues.

Working Group 4 Facilitator: Robert Merwin – Executive Advisor - Assistant Deputy Minister - Mines and Minerals, MNDM

Working Group 4 Members:

- John LeClair, Goldcorp, Toronto – (OMA)
- James Niemi – LU 6500 H&S Representative (Labour Representative)

Working Group 5: Health and safety hazards.

Working Group 5 Facilitator: Bob Barclay – Provincial Coordinator, MHSP, MOL

Working Group 5 Members:

- Frank Demers, Vale, Sudbury – (OMA)
- Eric Lachance – USW Local 2020 (Labour Representative)

Working Group 6: Emergency preparedness.

Working Group 6 Facilitator: Alex Gryska – General Manager, Mine Rescue, WSN

Working Group 6 Members:

- Jamie Mortson, LSG, Timmins – (OMA)
- Dave Stewart – Mine Mill Local 598 H&S Coordinator (Labour Representative)

All the Working Groups are reviewing recommendations from past inquiries and Coroner's jury inquests related to their topic areas as well as relevant submissions from the public consultations. Topics being explored by one Working Group may overlap and/or impact the work of other groups so the facilitators meet regularly to share information and maximize each group's work. In addition to making specific recommendations, the Working Groups will identify issues that require further study.

1. Capacity of the Health and Safety System Working Group

Purpose: To explore capacity issues in Ontario's health and safety system by:

- understanding the potential growth of the sector and predicting the types of mining, processing and technology that will characterize the sector in the future
- exploring the current state of the Ministry of Labour's mining program's enforcement and compliance assistance practices
- understanding the current capability of the Ministry of Labour in terms of operational and technical strength
- understanding Workplace Safety North's compliance assistance practices for the mining sector
- estimating the extent to which the Ontario Occupational Health and Safety System is capable of addressing the mining sector's current and future health and safety hazards and issues
- devising strategies to correct any identified deficiencies in the Ontario Occupational Health and Safety System that would prevent it from effectively contending with the mining sector's current and future health and safety hazards and issues

Deliverables: The Working Group's key deliverables include:

- a summary of the group's investigation findings on the future state of the Ontario Mining Sector including: expected growth, types of mining processing and technology, the mining sector's current and future health and safety hazards and issues, and the ability of the Ontario occupational health and safety system to effectively deal with these hazards and issues
- strategies to address any identified deficiencies that would prevent the system from effectively addressing the mining sector's occupational health and safety needs

Completed Work: To date, the working group has completed the following tasks:

- identified new mineral deposits that are expected to be developed over the next five years

- characterized these deposits in terms of their depth and geometry
- reviewed the findings of the Management of Change Working Group to identify the types of new technology that are likely to emerge in the Ontario Mining Sector over the next five years
- identified the existing operating mines that are expected to close over the next five years
- identified potential ways to improve Coroner's Inquests on mining sector facilities

Next Steps: Next steps include:

- completing 11 tasks that are in progress
- exploring relevant input from the consultations

2. Technology and Management of Change Working Group

Purpose: To define the optimal processes to introduce new technology and processes into the Ontario Mining Sector by:

For the Health and Safety Implications of Technology

- reviewing potential hazards/benefits of introducing of new technology/processes, including analyzing some new technologies currently being introduced to Ontario and where possible, some that could be introduced over the next few years
- seeking stakeholder views on technology and risk assessment

Management of Change

- conducting research and soliciting advice from experts on best practices in change management processes that could be applied to understand the health and safety implications of new technology and processes
- recommending strategies to establish new technology change management process standards for Ontario's mining sector

Risk Assessment

- conducting research and soliciting advice from experts on optimal risk assessment models
- considering options to ensure standardized risk assessments in the mining sector

Deliverable: The Working Group's key deliverable will be a report that explores the optimal processes for introducing new technology and processes into Ontario's mining sector

Completed Work: The Working Group has completed the following tasks:

- identified three goals: 1. Health and safety implications of technology, 2. Change management best practices and 3. Best practices in risk assessment models
- gathered information on regulatory approaches in Canada, Australia and USA

- reviewed previous mining inquiry recommendations, Coroner's Jury Recommendations and public submissions to the Review
- reviewed information provided by the Ontario Mining Association on best practices in change management in Ontario (this task is on-going)
- held joint meeting with Capacity Working group and Professor Jim Joy (Australia), a global expert in safety and risk management
- established criteria for evaluating change management policy and implementation

Next Steps: Next steps include:

- evaluate change management practices of Ontario mining companies against criteria to establish findings and recommendations
- meet with international experts on three goals by teleconference/Skype
- explore relevant input from the consultations

3. Internal Responsibility System Working Group

Purpose: to examine the Internal Responsibility System (IRS) in the Ontario Mining Sector by:

- conducting research and soliciting advice from experts on best practices in IRS processes that could be applied to enhance IRS in the mining sector
- seeking stakeholder views on the functioning of the IRS as part of the analysis
- recommending strategies for improving the IRS in the Ontario mining sector

Deliverable: The Working Group's key deliverable is a report that recommends strategies to improve the IRS in Ontario's mining sector.

Completed Work: The Working Group has completed the following tasks:

- reviewed all IRS recommendations from past mining reviews and commissions
- completed a report of Phases 1-3 of the IRS Survey facilitated by the Workplace Safety North with Ontario's mining industry
- developed a list of experts and arranged for them to present to the Working Group
- reviewed recommendations of mining-related Coroner's reports on the IRS

Next Steps: Next steps include:

- work to develop a consensus around what the IRS is and the best method to ensure it is functioning in the workplace including a consensus understanding of the roles of workplace parties
- identify research and approaches related to safe, profitable production and the characteristics of world class health and safety management systems

- investigate legislation from other jurisdictions related to the IRS (the scan of OHS legislation is now underway) and contact the OHS Subcommittee of Canadian Association of Administrators of Labour Legislation
- review approaches and strategies in other jurisdictions that result in successful working relationships
- review findings on the IRS from the public consultations
- collect data from safety system partners on the IRS
- identify the extent to which the Ministry of Labour can respond to IRS-related issues
- identify the extent to which the mining industry can respond to IRS-related issues
- identify the extent to which labour can respond to IRS-related issues
- develop a tool to analyze approaches and tools for strengthening the IRS
- use the tool to analyze approaches to the IRS
- identify opportunities to strengthen the IRS in Ontario mines
- identify any gaps the Working Group would like to see investigated further
- prepare final report

4. Training, Skills and Labour Supply Issues Working Group

Purpose: To examine the training, skills and labour supply issues in Ontario's mining sector by:

- reviewing research and soliciting advice from experts to identify challenges and solutions related to training, skills and labour supply issues
- including stakeholder views in the analysis
- recommending strategies to address training, skills and labour supply challenges

Deliverable: The Working Group's key deliverable is a report that sets out the best practices and challenges related to training, skills and labour supply issues, including recommending strategies to address these challenges.

Completed Work: The Working Group has completed the following tasks:

- reviewed legislative framework with regard to training
- reviewed training providers' framework
- reviewed public consultation sessions input
- reviewed relevant recommendations from Coroner jury reports and commissions/inquiries
- assessed the potential for future growth in Ontario's mining sector

Next Steps: Next steps include:

- reviewing relevant legislation and health and safety training initiatives in other Canadian mining jurisdictions as well as international best practices
- developing a more detailed analysis of the impact of new mine development and expansion on labour supply issues and their implications for health and safety (consistent with the research undertaken by the Capacity Working Group)
- exploring other areas including:
 - legislative framework
 - Common Core modular training program and specialty modules
 - hazard awareness
 - supervisor training
 - health and safety/training “culture”
 - mining as a trade

5. Hazards Working Group

Purpose: To identify the key health and safety hazards in Ontario’s mining sector by:

- preparing a complete and up-to-date description of health and safety hazards associated with the sector
- establishing the level of risk associated with each hazard and developing strategies to eliminate or reduce the risk of priority hazards
- determine the extent to which the Ontario Health and Safety System has been able to provide support or has required workplace parties to mitigate the risk associated with each hazard on the list

Deliverable: The Working Group’s key deliverable is a report that identifies the key health and safety hazards in Ontario’s mining sector and makes recommendations to minimize their impact.

Early deliverables include:

- a risk analysis process that produced a “heat map”, which identifies priority health and safety risks in the mining sector. The heat map will allow workplace parties and the health and safety system to target their prevention efforts to the greatest risks.
- input into the creation of a mining sector hazard list for Part Two JHSC certification training

Completed Work: The Working Group has completed the following tasks:

- Prepared for and executed a risk assessment session involving representatives from labour and management to risk rank all known sector health and safety hazards.

Next Steps: Next steps include:

- interpreting and analyzing the findings from the risk assessment session
- establishing a small expert group for each high-ranking health and safety hazard. Each group will carefully examine its assigned hazard to develop recommended strategies for the mining sector aimed at eliminating the level of harm where possible, and where not possible, aimed at reducing the level of harm to the lowest level possible.
- exploring relevant input from the consultations

6. Emergency Preparedness / Mine Rescue Working Group

Purpose: To assess the ability of the current emergency preparedness and response system in light of changing mining processes by:

- conducting research and soliciting expert advice to identify best practices for emergency management processes and optimal models for emergency preparedness
- considering stakeholder views on the present state of emergency preparedness and the issues associated with future mining processes
- recommending strategies to ensure that Ontario's mining emergency preparedness and the Mine Rescue program continue to be world leaders

Deliverable: The Working Group's key deliverable is a report that will include:

- a summary of options for emergency preparedness, management and response techniques and processes that take into account the hazards posed by new mining processes, demographics and labour challenges
- a summary of emergency preparedness/mine rescue models to address any issues with the current model
- strategies to ensure continuous evaluation of the emergency preparedness system's capacity to meet future needs
- a review of current regulatory requirements related to emergency preparedness and response with recommendations to strengthen them

Completed Work: The Working Group has completed the following tasks:

- explored the permitting of new mines and the process of informing new operators of their legal responsibilities for emergency preparedness
- reviewed current regulations related to formal risk assessments and emergency preparedness/response capability

- reviewed mine rescue legislation in other jurisdictions including requirements related to above ground mining
- reviewed the role of the Mine Rescue Technical Advisory Committee and the International Mines Rescue Body
- reviewed mine rescue team training and competition participation
- reviewed the current refresher training requirements
- reviewed issues regarding the effect of cold or hot temperatures on rescues
- reviewed the role of technology in mine rescue
- reviewed the ability of the system to respond to issues

Next Steps: Next steps include:

- consolidating information from completed research and reviews
- exploring relevant input from the public consultations
- drafting potential recommendations

Appendix C – Overview of Stakeholder Input

During the public consultations and in the written submissions, certain issues were consistently raised. The following is a summary of those issues, organized into the six issue areas identified by the Advisory Group as well as an “other” category.

Note: this is not a comprehensive list of all topics or opinions heard through the public consultation. However, the Review is considering all relevant comments and recommendations. Input that is outside of the scope of the Review will be shared with the appropriate parties for their consideration.

1. Capacity of the health and safety system

- The importance of a well-trained, consistent inspectorate. Opinions on the role of inspectors differed: some stakeholders wanted more focus on enforcement; others wanted inspectors to play a stronger advisory role.
- The need for the Ministry of Labour to have access to the necessary technical expertise to support prevention and enforcement activities, especially expertise in areas such as ground control and ventilation.
- The importance of clarity and transparency, and the need for the Ministry of Labour to provide more information on its enforcement activities and guidance on the regulations.
- Strong support for the training provided by Workplace Safety North and the Workers Health and Safety Centre, and the need to address the ability of workplaces – especially those outside the Sudbury basin – to access training programs.
- The need to improve the Coroner’s Inquest process and requests for the Ministry of Labour to work with the Ministry of Community Safety and Correctional Services to investigate ways to improve the process.

2. The Internal Responsibility System

- The importance of a common understanding of the term “Internal Responsibility System” and how it is implemented in the workplace, based on the principles set out in the Ham Commission report.
- The need for an improved Joint Health and Safety Committee (JHSC) Certification Standard and quick implementation of the proposed JHSC Training Standards.
- The important role of the front line supervisor in enabling a functioning IRS and the need for supervisor training that includes ways to enhance the IRS in the workplace.

- The critical role that the working relationship between employees and employers in a workplace plays in determining the success of the IRS, and ways to promote better communication of health and safety issues as one way to improve that relationship.
- Many submissions provided recommendations on how the IRS could be strengthened by providing workers and the JHSC with greater powers in the workplace to affect change
- The importance of active senior management support for the IRS, and the need for more accountability and/or speciality training modules for senior managers.
- The importance of all people working in mines being free from the fear of reprisals, and the need to enhance protection from reprisals.

3. Technology and the Management of Change

- The need to develop a standard risk assessment model to be used in the mining sector including the possibility of a regulation requirement risk assessments.
- The critical importance of proper change management processes that include risk assessments when implementing new technology or processes.
- Greater employee participation in evaluating risk and in change processes, and clearer guidance on the involvement of employees and JHSCs (i.e. meaningful engagement/consultation rather than just informing worker members).
- The importance of sharing information on new technologies introduced in the workplace and developing a method to share information on any operational issues related to a new technology.

4. Mining Hazards

- The recognition that most underground mining hazards are known and are not new (i.e. the hazards of a decade ago are the same hazards today). Acknowledgement that ground control and mobile equipment hazards are major sources of risk in mines.
- The importance of workplace parties and the health and safety system addressing these known hazards/risks.
- Concerns about proper mine ventilation, the control of occupational disease and ergonomics in underground mining. The need for the mining sector to put more focus on controlling occupational disease.
- The critical importance of visibility in low light settings and the hazards associated with sight line issues posed by large moving equipment. The need to implement best practices such as providing Class 3/Level 2 high-visibility safety apparel.

- The need for the Ministry of Labour to enhance its ability to regulate new mining hazards, including concern that regulatory change is too slow and regulations are not keeping pace with changes in the mining sector.

5. Training and Skills Development

- Almost unanimous support for the Common Core concept and approach for the mining sector. Concerns focused mainly on the delivery of modules rather than the content. Some expressed need to develop better standards for trainers.
- Concerns about the training of new employees, including those from demographics not traditionally part of the mining sector. The importance of methods to evaluate the effective transfer of knowledge, with the key focus on competency.
- Despite overall support for the Common Core, the need to review some modules, especially those related to supervisors. If standards for trainers and evaluation tools are developed the importance of considering the differing lengths of time spent to complete the modules.
- Concerns that, once an employee completes the necessary modules, no further training is required and the need for mandatory refresher training.
- Some support for making mining a registered trade and developing the appropriate apprentice programs to ensure knowledge is transferred from the more experienced miner to the apprentice. However, also strong opposition to this idea from those who feel the current Common Core modular training model serves the sector well.

6. Emergency Preparedness and Mine Rescue

- Strong support for and pride in Ontario's mine rescue system, and general satisfaction with the current way mine rescue is set up and operates.
- The need to evaluate the ability of mine rescue to respond to hazards created by new technologies and mining methods. Concerns about the ability to launch rescue operations as mines in Ontario get deeper and distances from the shaft increase.

7. Other

- Comments on Coroner's inquests and their recommendations. A desire for Coroner's jury recommendations to be mandatory and for the process to include mechanisms to ensure Coroner's jury members are knowledgeable about mining and mining practices as well as relevant legislation.
- The need for better funding for research related to underground mining health and safety.

- The need to improve the method of reaching out to stakeholders for the public consultations (e.g. using paid media advertising as well promoting the sessions through employers and unions).
- Support for the Review but regret on the part of some that the provincial government did not strike an inquiry.