

Chief Inspector of Mines



2018

# Annual Report

# › Mandate

- › To ensure worker health and safety, public safety, and reclamation and protection of the land and watercourses affected by mining and exploration in B.C.
- › To administer and regulate the full mining cycle, including exploration, development, production, reclamation and closure for metal, placer, industrial mineral and coal mines, and gravel pits and quarries.

The Chief Inspector of Mines is the statutory decision maker named in the [Mines Act](#). The Mines Act applies to all mines during exploration, development, construction, production, closure, reclamation and abandonment.

[The Health, Safety and Reclamation Code for Mines in British Columbia](#) (the Code) applies to all mines and sets out the following purpose statements:

- *Protect employees and all other persons from undue risks to their health and safety arising out of or in connection with activities at mines.*
- *Safeguard the public from risks arising out of or in connection with activities at mines.*
- *Protect and reclaim the land and watercourses affected by mining.*
- *Monitor the extraction of mineral and coal resources and ensure maximum extraction with a minimum of environmental disturbance, accounting for sound engineering practice and prevailing economic conditions.*

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## › Executive Summary: Mining in BC

Mining is one of British Columbia's most dynamic industries and has been a central component of the province's economy for many years. B.C.'s mineral sector accounted for over 30,000 direct jobs in 2018<sup>1</sup>, while production estimates for major commodities mined in the province was an estimated \$9.7 billion<sup>2</sup>. Industry mineral exploration spending in 2018 totalled \$331 million<sup>3</sup>.

The provincial government remains committed to maintaining a globally competitive mining sector that creates jobs and grows the economy. It is also mindful of its commitment to provide effective oversight. Mining is one of B.C.'s safest heavy industries and the province is a leader in mine health and safety practices.

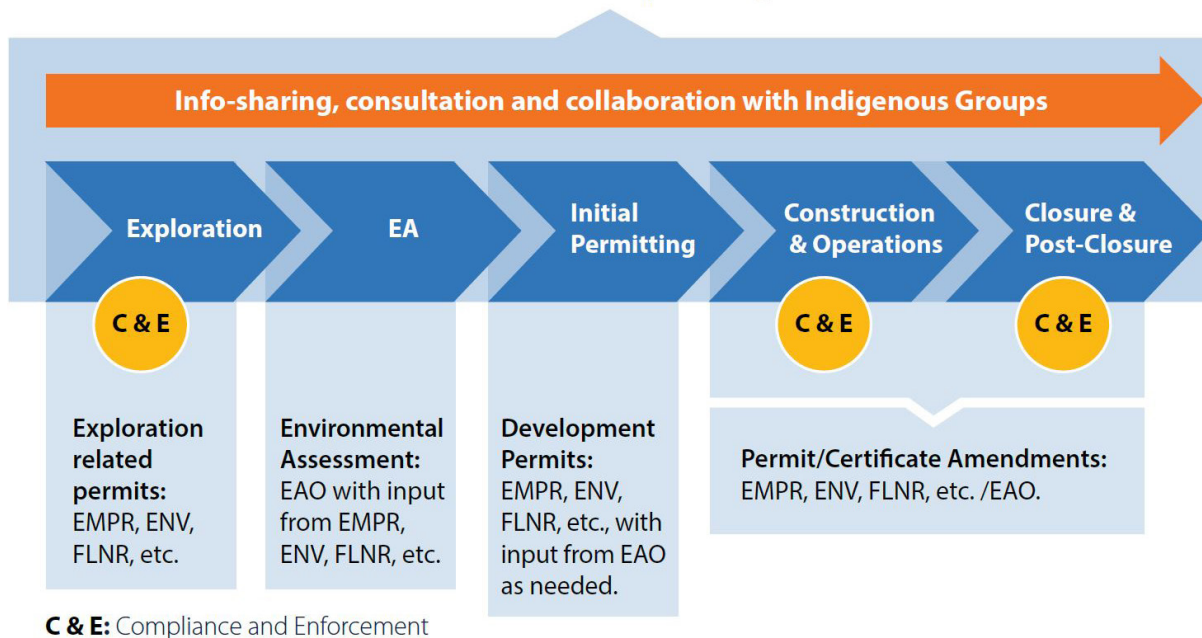
The Office of the Chief Inspector of Mines is involved at every stage of a mine's life. To ensure that mineral exploration and mining activities are conducted safely and responsibly, the Office of the Chief Inspector of Mines and staff with the Ministry of Energy, Mines and Petroleum Resources work with industry, workers, and communities.

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***"The provincial government is committed to a competitive mining sector that creates jobs and grows the economy."***

### Regulatory Continuum - The Life Cycle of a Mine

Coordination between partner agencies



1. [www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/statistics/employment](http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/statistics/employment)

2. [www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/statistics/production](http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/statistics/production)

3. [www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/statistics/exploration-spending](http://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/statistics/exploration-spending)





## › A Message from the Chief Inspector of Mines

December 2019

2019 was an exciting time to join the Ministry of Energy, Mines and Petroleum Resources (EMPR). With the announcement of Budget 2019, the Mines and Mineral Resources Division separated into two: the Mines Health, Safety and Enforcement Division (MHSE) and the Mines Competitiveness and Authorizations Division (MCAD). I took over the responsibility for the Office of the Chief Inspector of Mines and focussed on growing the Health and Safety Branch as a new unit separate from other regulatory functions. Indeed it was a year of growth and change but embedded throughout all our work is our priority of advancing Indigenous reconciliation.

This report reflects the activities of the Office of the Chief Inspector of Mines for the calendar year of 2018, including permitting, health and safety, and compliance verification activities. In 2018, there were 17 major mines in production in the province (eight coal and nine metal), and six producers entered the care and maintenance phase. The 2019 annual report will provide further reflection on the organizational changes brought into place and the outcomes of initiatives such as the BC Mining Jobs Task Force.

Heading into 2020 we are ardent about our role in improving health and safety for workers, public and the environment, and maintaining BC as a competitive jurisdiction for mineral exploration and mining. In working towards the goal as a more effective regulator, we are updating the approach to risk-based inspections, streamlining permitting processes and ensuring timely communication of safety messages to industry.

I wish to thank Al Hoffman for over 10 years of leadership that he provided to the Mines Inspectorate as Chief Inspector of Mines, and for strong support as I transitioned into the role. Al has taken on a new role as executive director of the Standing Code Review Committee to ensure that the Health, Safety and Reclamation Code for Mines in BC is updated to reflect leading practices.

Sincerely,

Hermanus Henning  
Chief Inspector of Mines

***“Embedded throughout all our work is our priority of advancing Indigenous reconciliation.”***

HVC (courtesy: Teck Resources)

# › About the Office of the Chief Inspector of Mines

## At A Glance: Key Functions

- ***Regulates all mines in BC***
- ***Reviews applications and issues permits***
- ***Conducts regular mine inspections, compliance reviews and enforcement activities***
- ***Reviews Mine Emergency Preparedness (MEMP) plans***
- ***Establishes geotechnical and reclamation standards***
- ***Liaises with mine management, unions and workers, occupational health and safety committees, communities, Indigenous Nations, and other technical organizations, committees, and government agencies***
- ***Supports research, development, and ongoing training to enhance best practices and promote new knowledge***
- ***Administers certifications and examinations***
- ***Collects data and maintains records with respect to accidents, dangerous occurrences and inspections***

› The Office of the Chief Inspector of Mines is located in Victoria in the [Ministry of Energy Mines and Petroleum Resources \(EMPR\)](#).

The Ministry has five regional offices, which are in Cranbrook, Kamloops, Prince George, Smithers, and Victoria. The executive director of regional operations oversees regional operations, with directors in each office responsible for their area.

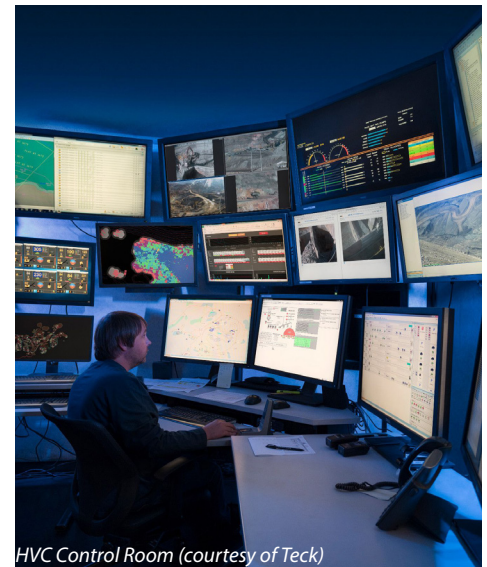


Coal Mountain (courtesy: GCPE GDU)

## › Sector Overview & Administration

The Minerals and Metals Production Statistics Program, which is administered jointly by Natural Resources Canada and Statistics Canada, indicates that the production value of B.C. mines increased in 2018.

While final production figures have yet to be released, estimates are currently \$9.7 billion, which indicates a significant increase from the \$8.8 billion generated in 2017. Estimates generated by the British Columbia Mineral and Coal Exploration Survey show that exploration expenditures in B.C. were \$331 million in 2018, up from \$246 million for 2017. Over 30,000 people in British Columbia were employed in mineral exploration, mining, and related sectors in 2018.



## › Metal and Coal Mine Activities

Nine metal mines and eight coal mines were in production across B.C. in 2018. The following tables provide information on the estimated production of these mines based on company reports.

### Metal Mines

Mine Name	Company	Nearby Community	2018 Production	
Brucejack	Pretium	Iskut	Gold	376,012 oz
			Silver	422,562 oz
Copper Mountain	Copper Mountain Mining	Princeton	Copper	78.85 million lb
			Gold	28,250 oz
			Silver	273,913 oz
Gibraltar	Taseko	Williams Lake	Copper	125.20 million lb
			Molybdenum	2.37 million lb
Highland Valley Copper	Teck	Logan Lake	Copper	222.23 million lb
			Molybdenum	8.70 million lb
Mount Polley*	Imperial Metals	Likely	Copper	14.97 million lb
			Gold	37,120 oz
			Silver	33,458 oz
Mount Milligan	Centerra Gold	Fort St. James	Copper	47.09 million lb
			Gold	194,993 oz

\* Care and Maintenance as of May 31, 2019

\*\* Commenced production September 2018



### Metal Mines (cont'd)

New Afton	New Gold	Kamloops	Copper	85.10 million lb
			Gold	77,329 oz
			Silver	300,000 oz
Red Chris	Imperial Metals	Iskut	Copper	60,349 lb
			Gold	41,935 oz
			Silver	103,634 oz
Silvertip**	Coeur Mining	Watson Lake	Silver	182,254 oz
			Zinc	4.18 million lb
			Lead	2.07 million lb

### Coal Mines

Mine Name	Company	Nearby Community	2018 Production (tonnes)
Brule	Conuma Coal	Chetwynd	2.5 million*
Coal Mountain	Teck	Sparwood	0.62 million
Elkview	Teck	Sparwood	6.66 million
Fording River	Teck	Elkford	8.93 million
Greenhills	Teck	Elkford	6.19 million
Line Creek	Teck	Sparwood	3.66 million
Willow Creek**	Conuma Coal	Chetwynd	0.16 million
Wolverine	Conuma Coal	Chetwynd	1.60 million

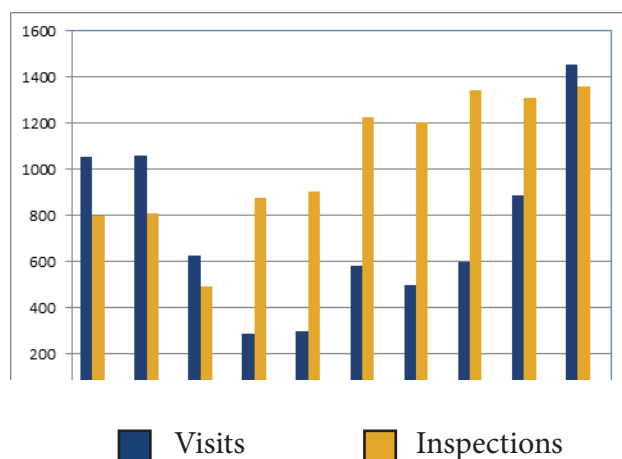
\* Annual average as reported by [www.conumacoal.com/operations](http://www.conumacoal.com/operations)

\*\* Restarted production June 2018

## › Mine Visits and Inspections

In February 2018, a new [Compliance and Enforcement Policy](#) was released and implemented across the Mines Inspectorate. This policy sets out compliance verification and promotion activities of the inspectorate and the tools available to inspectors when addressing incidents of non-compliance and provides guidance on risk-based considerations that inform the use of each tool.

EMPR staff and contractors visit mines to conduct inspections as well as meetings, investigations or training. In 2018, EMPR conducted 1369 inspections at mine sites across BC, and conducted an additional 60 visits for meetings, training and certifications.



**Figure 1:** Number of Mine Visits & Inspections, 2009-2018

## › Orders

During their reviews, Mines Inspectors may decide to issue orders for contraventions of the Mines Act, the Code, other applicable regulations, or permit conditions.

There were 5195 orders issued from inspections, of which 45 were orders to suspend work due to a health and safety hazard.

***“In 2018, Mines Inspectors made 1429 combined inspections and visits to mine sites across BC.”***

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## › Spotlight on Training

The inspectorate has grown significantly and is continuously improving. Twenty-one new inspectors completed the mandatory training curriculum in 2018 and participated in field mentorships prior to being appointed by the chief inspector of mines. Field mentorship is a focus for new inspectors who learn from experienced inspectors and participate in inspections at a variety of mines around the province.

Learning and development activities supported the implementation of the new C&E policy along with new systems and tools for inspectors. In 2018, trainers delivered 21 courses to the mines inspectorate. The inspector training program focusses on skills development and continuous improvement to proactively support best practices in mining regulatory oversight.



## › Permitting

Mining activities require a Mines Act permit before work can begin. The requirements depend on the mine type as well as the scope of proposed activities.

EMPR's regional offices are responsible for processing applications under section 10.1.1 of the Code for all exploration, placer, quarry, and sand and gravel mining activities. Applications are submitted through a Notice of Work and are reviewed by EMPR regional staff, Indigenous Nations, other agencies and specialist technical staff as required.

For larger metal and coal mines that fall under section 10.1.2 or 10.1.18 of the Code, applications are submitted to the Office of the Chief Inspector of Mines for review. This includes applications for new mines, as well as applications for expansions or upgrades to existing mines, amendments for changes to existing mines, and some large-scale exploration and development projects.

An interagency review supports the review of major mine projects. A Mine Review Committee (MRC) coordinates this work, which is led by the Major Mines Permitting Office (MMPO) within EMPR. Where multiple authorizations are required, the MMPO coordinates the review of all applications, providing a one-window approach for proponents. The MMPO-led process supports a thorough, timely, and integrated assessment of a project and provides meaningful opportunities for participation by Indigenous Nations, proponents, local governments, and federal and provincial agencies.

New major mines and expansions may be subject to the [Environmental Assessment Act](#) and require an Environmental Assessment Certificate. The [Environmental Assessment Office](#) (EAO) manages this environmental assessment (EA) process. For larger projects and major expansions, the environmental assessment typically precedes the Mine Act permit application review: an EA certificate is required prior to the issuance of any other permits or authorizations.

MMPO works with the EAO and relevant permitting agencies including the Ministry of Environment and Climate Change Strategy and the Ministry of Forest, Lands, Natural Resource Operations and Rural Development as mining projects transition from exploration, through EA, to permitting, development, operation and closure. This coordination along the regulatory continuum ensures that issues are tracked and addressed at the most appropriate and effective stage of project development.

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***“An interagency committee supports the review of major mine projects.”***



## › Collaboration with Indigenous Nations

The provincial government is committed to transforming its relationship with Indigenous peoples. EMPR works collaboratively with Indigenous Nations throughout the full lifecycle of a mine to ensure the latter's interests are considered in the Province's decision-making processes. Through the Economic and Community Development Agreement program, the provincial government also shares mineral tax revenues with affected Indigenous Nations on new major mines to support their socio-economic priorities.

## › Major Mine Technical Operations

Part of the Office of the Chief Inspector of Mines, Major Mines Technical Operations provides regulatory oversight of major mines focussed on areas of geotechnical engineering, environmental sciences and mine reclamation. Staff in this group are technical specialists in their respective disciplines.

They provide oversight through technical review of major mine applications, recommendation of permit conditions and conduct of mine inspections. Work of this group balances environmentally sound and economically viable solutions to enable B.C.'s mining industry to remain internationally competitive without compromising rigorous environmental standards.

The Major Mines group participates in national and international committees promoting research and technology transfer. They organize and participate in various provincial committees and activities that review and highlight best practices and facilitate government co-operation with industrial, public, and academic institutions.

The Province encourages mining proponents to engage early in the project planning stages with Indigenous peoples and to build ongoing, strong relationships throughout the life of mining projects.

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***"The provincial government shares mineral tax revenues with affected Indigenous Nations on new major mines to support their socio-economic priorities."***

### › 2018 Highlights

- ***Conducted over 140 inspections at major metal and coal mines and regional mines including placer, sand and gravel, and quarry operations.***
- ***Developed an application guidelines document, as well as guidance documents to assist mine proponents in developing environmental management plans in consultation with MOE. These documents provide detailed information requirements to mine proponents.***
- ***Reviewed annual reports for tailings storage facilities, waste rock dumps and pit walls.***
- ***Conducted dam safety inspections (DSIs) and dam safety reviews (DSRs) at four abandoned tailings storage facilities (TSFs) under government purview and continued to address recommendations in site work plans.***
- ***Issued 32 Mines Act permit amendments for major mines across B.C., participated in environment assessment reviews of seven projects, coordinated mine review committees for 15 projects.***



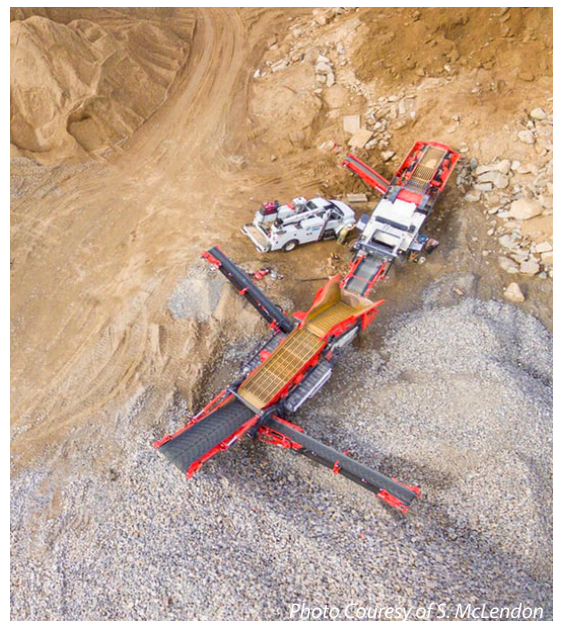
- **Represented the provincial government on the National Orphaned and Abandoned Mines Advisory Committee.**
- **Represented EMPR as a member of the BC Inter-Ministry Invasive Species Working Group.**
- **Contributed to the organization of the annual Mine Environment Neutral Drainage (MEND) ML/ARD workshop attended by approximately 200 participants.** The theme for 2018 was “Challenges and Best Practices in Metal Leaching and Acid Rock Drainage.”
- **Contributed to the organization of the annual BC Technical and Research Committee on Reclamation’s Mine Reclamation Symposium attended by over 188 delegates.** The meeting included a short course and field trip on the remediation work conducted to date at Mount Polley.



## Spotlight on Permitting Activities

### › Giscome Quarry

Once in full operation, the Giscome Quarry and Lime Plant near Prince George will produce 200,000 tonnes of lime per year for sale to industrial customers in western Canada. The Major Mines Office coordinated the government and Indigenous review of permit applications, including working with representatives from Northern Health. The proposed plant site is about one kilometre from Giscome Elementary School. A key focus of the Mine Review Committee process was on identifying appropriate Environmental Management Act permit conditions to manage potential air quality impacts on the school and nearby residential, farming, and recreational areas.





## › Health and Safety

### Spotlight: Greater Protection for Worker Health

In 2018 the Occupational Health and Ergonomics Department increased its focus on fatigue at mines in British Columbia. Fatigue has been recognized as a global challenge that affects all organizations and workers at every level. Its impact in the workplace includes the increased potential for injuries, poor health, and reduced productivity.

Department initiatives included participation in a CSA fatigue management research focus group, introduction of a fatigue management awareness resource for industry, facilitation of a fatigue research project, and the development of relationships with stakeholders from the mining industry as well as with professionals from other industry sectors, regulatory agencies, safety associations, labour groups, and academia.

### › Certifications

The Mines Act requires that everyone employed at a mine must, if required by the regulations, the Code, be under the daily supervision of a person who holds a valid and appropriate certificate.

Holders of valid permanent certificates must complete re-examination every five years to ensure their knowledge of the Code remains current.

### › Mine Supervisor Certificates

The recent code review re-introduced the requirement for mine supervisor certification. As of June 1, 2018, all mine workers responsible for supervising six or fewer employees in open-pit mining activities or any number of employees on exploration sites or in other areas of a mine, such as a mill, tailings storage facility, lab, or maintenance area or shop must have successfully completed the mine supervisor certification. This applies to all mine sites in B.C. including major mines, exploration sites, sand and gravel, and placer operations and quarries. This also includes any construction contractors who carry out work on a mine site. This requirement does not apply to supervisors who have valid shiftboss certificates.

In 2018, 3,682 certificates were issued with two cancellations.

### › Shiftboss Certificates

When six or more people are working in an open-pit or underground mine, they must be under the supervision of a person holding a shiftboss certification. The following table summarizes shiftboss certification activity in 2018.

Shiftboss Certification Type	New Certificates
Surface (includes sand and gravel)	114
Underground	59
Total Permanent Certificates Issued	173

### › Mine Rescue Certifications

Mine employees seeking mine rescue certification must complete approved training and demonstrate their knowledge in rescue techniques by passing an exam that consists of both a written and a practical skills component.

The Ministry is responsible for certifying miners in two categories of mine rescue. The following mine rescue certificates were issued in 2018.

Certification Type	New Certificates
Underground mine rescue	170
Surface (open-pit) mine rescue	309
Total Certificates Issued	479

## Underground Coal Fireboss Certificate

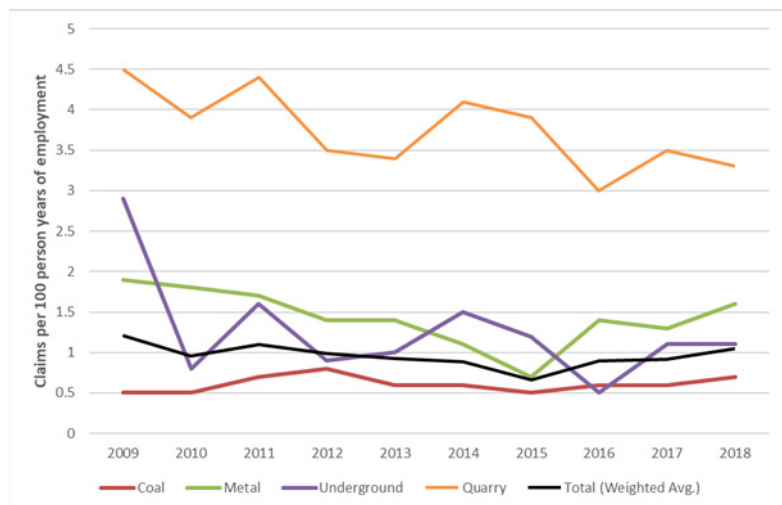
Fireboss certification is required to supervise people in underground coal mines. Four underground coal fireboss certificates were issued in 2018, and none were suspended.

## › Accidents and Incidents

### › Injury Rates

Safety is a top priority for B.C.'s mining companies as well as the provincial government. The sector continues to be one of the safest heavy industries in the province, with B.C. a world leader in mine health and safety practices. WorkSafeBC data indicates the 2018 total estimated injury rate at mines in British Columbia was 1.1, which is a small increase over 2017.

The table in Figure 2 outlines the injury rates for the mining industry over the past 10 years; the unit for injury rates is the number of claims per 100 person-years of employment. Note that rates may be adjusted on an ongoing basis to match new and ongoing claims data.



**Figure 2:** Injury Rates for Quarries, Open-Pit Coal, Open-Pit Metal, and Underground Mines in British Columbia, 2009–2018

## Blasting Certifications

Blasting certification is required to perform blasting on a mine site in B.C. Types of blasting certificates include basic, exploration, surface, underground, underground coal (shotfirer), electrical blasting, and general, which includes all categories except underground coal. In 2018, 130 new blasting certificates were issued, and one was suspended.

### › Fatalities

There were three mining-related fatalities in 2018.

- In April 2018, an equipment operator drowned when his amphibious excavator rolled over in water at a coal mine.
- In June 2018, a mine worker was fatally injured after being hit by overhead falling rock that is suspected to have been ejected from a portable jaw crusher unit at a quarry.
- In November 2018, the driver of a light-duty vehicle was fatally injured during a collision with a haul truck at a coal mine.

# › Occupational Health and Ergonomics

The Occupational Health and Ergonomics Department's inspectors are responsible for the review, development, enforcement, promotion, and education of occupational health and ergonomics regulations as established by the Mines Act and the Code. Department activities focus on the prevention of occupational illness, injury, and disease in British Columbia's mining industry.



## › At A Glance: Department Responsibilities

- *Conducts mine inspections to enforce compliance with the Mines Act and the Code, focusing on the requirements of Part 2, Occupational Health and other applicable parts of the Code.*
- *Conducts reviews of site-specific occupational health and ergonomics programs that address the anticipation, recognition, evaluation, and control of health hazards.*
- *Provides resources, guidance, and education on occupational health and ergonomics issues.*
- *Leads or assists in research and development of occupational health and ergonomics standards, policy, and regulation.*
- *Participates in technical reviews of proposed mining projects.*

## › 2018 Highlights

- Conducted onsite inspections throughout the province to ensure occupational health and ergonomics programs for evaluating health hazards and protecting/monitoring worker health are being effectively implemented.
- Reviewed progress of projects regarding the evaluation and implementation of controls to provide increased protection of worker health.
- Participated in Mine Development Review Committees to address and encourage anticipation, elimination, and control of occupational health concerns in the early phases of project development and design.
- Provided support for the development of the Mine Supervisors Certification Program, the 2018 Provincial Mine Rescue competition, and regional dust-management projects.



## › Mechanical & Electrical Engineering

Mechanical and electrical inspectors are located throughout B.C. They ensure that all mechanical and electrical equipment installed and used at mines in the province complies with the Code and all its applicable standards, and that the equipment is maintained and operated appropriately to reduce risks to people and property.

### › At A Glance: Department Responsibilities

- ***Ensures mechanical and electrical equipment installed and used at mines in BC complies with the Mines Act as well as applicable codes and standards.***
- ***Ensures equipment is maintained and operated appropriately to reduce risks to people and property.***
- ***Participates, as appropriate, on Mine Development Review Committees and investigations.***

### › 2018 Highlights

- Participated and provided advice and resources for over 82 Mine Development Review Committee meetings.
- Conducted over 165 inspections across the province, an increase of 26 per cent when compared with the average of the past four years.
- Provided feedback and expertise to the mines inspectorate for training, general equipment discussions, and other related topics.
- Contributed to eight CSA and ISO standards committees.
- Provided expertise and oversight for the development and the implementation of requirements for autonomous mining equipment, both surface and underground autonomous and semi-autonomous operations. Autonomous mining is becoming more prevalent in mines in B.C. with more operations considering this new technology.
- Provided advice on over 20 variance requests relating to mechanical and electrical issues at mines.
- Participated in several investigations into serious mine incidents.
- Participated in the development and implementation of several mine rescue tasks for the Provincial Mine Rescue competition.



H4 Processing Plant (courtesy of Teck Resources)

## › Competitions & Awards

Many BC mining companies not only meet the applicable requirements of the Mines Act and the Code but also voluntarily and consistently exceed them. Through their efforts and those of provincial government staff, mining is one of B.C.'s safest heavy industries.

### › Provincial Mine Rescue & First Aid Competition

The Provincial Mine Rescue & First Aid Competition highlights the B.C. mining industry's commitment to health and safety best practices; it has been held annually since the 1950s. Mine rescue teams from all over the province compete against one another in head-to-head matches involving simulated mine rescue situations. Teams are tested on their emergency response and rescue abilities in either surface or underground categories. This annual competition is also an intensive learning opportunity that ensures British Columbia's mine rescue teams are trained to the same high standards.

Kimberley hosted the 63rd annual competition in June 2018. EMPR staff and industry personnel judged the competitions and congratulate all the winners.

#### › Surface Mine Rescue

- *Ron Brow Memorial Trophy (Best Extrication for Surface Team):* **Line Creek Operations**
- *Maurice Boisse Memorial Trophy (Best Bench for Surface Team):* **Fording River Operations**
- *East Kootenay Mines Industrial Safety Association Trophy (Best Written for Surface Team):* **Line Creek Operations**
- *East Kootenay Mines Industrial Safety Association Mine Rescue Memorial Trophy (Best Team Rope Task):* **Highland Valley Copper**
- *Levitt-Safety Fire Trophy (Surface):* **Highland Valley Copper**
- *North South Central First Aid Trophy (Best First Aid by Surface Team):* **Highland Valley Copper**
- *HVC Highest Non-Aggregate Points Trophy:* **Line Creek Operations**
- *Overall Surface Mine Rescue Winner:* **Line Creek Operations**

***"This annual competition is an intensive learning opportunity that ensures British Columbia's mine rescue teams are trained to the same high standards."***

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#### › Three-Person First Aid Competition

- *Three-Person First Aid Trophy (Best Three-Person Team):* **Line Creek Operations**
- *Kathy Lofstrom Memorial Trophy (Best Coach for Three-Person First Aid):* **Sandra McRae – Line Creek Operations**

#### › Underground Mine Rescue

- *Best Bench Technician Trophy:* **Brandon Moe – New Afton**
- *USWA Mine Mill Trophy (Best Underground Coordinator):* **Brandon Moe – New Afton**
- *Richard Booth Award (Best Written for Underground Team):* **Myra Falls**
- *Sullivan Cup (Best First Aid by Underground Team):* **New Afton**
- *Barry Abbott Memorial Trophy (Best Underground Practical Skills):* **Silvertip**
- *Best Performance in Underground Smoke:* **New Afton**
- *Keith Bracewell Memorial Award (Best Obstacle and Recovery):* **Myra Falls**
- *Levitt-Safety Fire Trophy (Underground):* **Myra Falls**
- *Overall Underground Mine Rescue Winner:* **Myra Falls**

## › Mine Safety Awards

British Columbia has long been a leader in mine health and safety. Industry, workers, and unions are dedicated to continued safety. Their commitment demonstrates that it is possible for mines to operate successfully while maintaining high standards for worker health and safety. To recognize the safety record of mines in B.C., the Province established the Mine Safety Awards in 1961.

The 57th annual awards ceremony took place in Victoria and recognized mines and quarries that accumulated 15,000+ worker or contractor hours with the lowest injury-frequency rate during the 2018 calendar year. Congratulations to the winners.

- *Large Underground Mine Safety Award:* **New Afton Mine**
- *John Ash Award – Open-Pit Mines and Quarries:* **Gibraltar Mine**
- *Edward Prior Award – Open-Pit Mines and Quarries:* **Wolverine Mine**
- *Stewart/O'Brian Safety Award – Open-Pit Mines and Quarries:* **Ward Road Quarry; Central Aggregates; Pitt River Quarries; Earle Creek, and Orca Sand and Gravel**

## › Spotlight: Chief Inspector of Mines Awards

The Chief Inspector of Mines Awards acknowledge courageous acts and individuals who make extraordinary contributions to mine safety. Three awards were presented in 2018.

Steve Rasilainen was awarded the Chief Inspector of Mines Award for Excellence in Health and Safety. Mr. Rasilainen demonstrates continued exemplary, industry-leading, and proactive health and safety initiatives at Windermere Mining Operations. His work and focus on continuous improvement and empowering employees have led to ISO 14001 and OHSAS 18001 certifications, a BC Occupational Health and Safety Committee Award, eight Stewart/O'Brian awards, 10 Certificates of Achievement, and a mine with 18 years of zero lost time accidents over the past 20 years.

Fireside Minerals Ltd.'s Fireside Barite Mine was awarded the Chief Inspector of Mines Award for Commitment to Ongoing Health and Safety Improvement. Fireside Barite received this award for committing to the opportunity to improve work conditions for mine workers through the continued development and implementation of safety measures and occupational health programs.

The Chief Inspector of Mines Award for Exemplary Fire and Mine Rescue was presented to New Afton Fire and Mine Rescue. In 2017 and 2018 New Afton Fire and Mine Rescue responded to emergency situations unrelated to mining activities in the surrounding communities and beyond in the province of B.C. Their fire and rescue activities and dedication in communities saved lives and homes and demonstrates exemplary service.

## › Certificates of Achievement, Special Commendations and Awards

Certificates of Achievement are presented to mines with a minimum of 15,000 worker hours and an injury frequency ratio of zero. Six were presented in 2018: Abbotsford Gravel; Keating Cross Road Pit; Windermere; Jamieson Quarry; Trend-Roman Mine; and West Ridge Quarries.

## › National Safety Awards (John T. Ryan Trophies)

John T. Ryan trophies are provided by Mine Safety Appliances Canada Limited as a memorial to its founder. The Canadian Institute of Mining, Metallurgy and Petroleum presents the awards to the metal mine, coal mine, and select mine that experienced the lowest reportable injury frequency per 200,000 employee hours across Canada. There are two trophy categories: Canada and Regional. For the second year in a row, the BC/Yukon Regional Metal Trophy for the lowest reportable injury frequency in the metal mine category during the 2018 calendar year was awarded to New Gold Inc.'s New Afton Mine.



## › Reclamation

### Industry Reclamation Record

As a condition of Mines Act permits, the permittee must provide financial security in an amount and in a form acceptable to the Chief Inspector of Mines. Securities can only be made payable in Canadian funds, and are held until the Chief Inspector is satisfied that all reclamation requirements for the operation have been fulfilled.

Because every mine site has unique management requirements and operational constraints, the assessment of financial security is done on a site-specific basis. The security is set at a level that reflects outstanding reclamation and closure obligations associated with the site. The amount of any security may be increased or decreased at the discretion of the Chief Inspector based on the risks at any time. Securities can only be released by the authority of the Chief Inspector of Mines.

### › Spotlight: Regional Mine Reclamation Bond Calculator

To provide regional mine inspectors with a defensible and consistent means of assessing reclamation liability for regional mines, a security bond calculator was introduced in 2018.

By implementing the Regional Mine Bond Calculator, government has enough funds to carry out required reclamation activities for regional mines. Introducing the calculator has also increased awareness and forethought about reclamation obligations and provides additional financial benefits to mines that undertake timely and adequate reclamation. Furthermore, it has increased confidence amongst the public and First Nations that land productivity will be restored and is expected to increase support for the opportunities and benefits from mining activities..



## › Reclamation Security Table

A summary of the estimated reclamation liability for major mines and current reclamation security held by EMPR is presented in the following table, which includes information up to December 31, 2018. Additionally, mine permits may contain schedules for placing additional security that are not reflected in this table.

Mine	Owner (2018)	Total Bond Amount (\$)	Liability Estimate (\$)	Differential (\$)
Elk Valley (Elkview, Fording River, Line Creek, Coal Mountain, Greenhills)	Teck Coal Ltd.	872,010,000.00	1,404,810,000.00	532,800,000.00
Sage Creek	Sage Creek Coal Ltd.	1,000.00	1,000.00	0.00

Tent Mountain	Luscar Ltd.	58,500.00	0.00	0.00
Sukunka	Tailsman Energy Inc.	50,000.00	67,500.00	17,500.00
Mt Speiker	Canadian Natural Resources Ltd.	10,000.00	10,000.00	0.00
Benson Mt.	Netherlands Pacific Mining Co. Ltd.	5,000.00	5,000.00	0.00
Willow Creek	Conuma/Willow Creek Coal Partnership	12,000,000.00	17,591,375.00	5,591,375.00
Quintette	Teck Coal Limited	20,083,200.00	27,020,000.00	6,936,800.00
Bullmoose	Teck Coal Limited	1,000,000.00	1,000,000.00	0.00
Benson Mt.	Wolf Mountain Coal Ltd.	20,000.00	20,000.00	0.00
Arctos Anthracite	Fortune Coal Ltd.	25,000.00	0	0.00
Quinsam	Quinsam Coal Corp.	7,281,000.00	7,200,000.00	0.00
Basin Coal	Basin Mine Ltd. Partnership	276,547.00	316,500.00	39,953.00
Brule	Conuma /Brule Coal Partnership	3,350,000.00	23,148,811.00	19,798,811.00
Wolverine	Conuma /Wolverine Coal Partnership	11,500,000.00	33,018,177.00	21,518,177.00
Trend-Roman	Peace River Coal Ltd.	73,900,000.00	72,863,886.00	0.00
Endako	Thompson Creek Mining Co.	15,345,700.00	42,608,000.00	27,262,300.00
Pinchi	Teck Resources Ltd.	2,000,000.00	2,000,000.00	0.00
Granisle	Glencore Canada Corp.	161,522.00	678,935.00	517,413.00
Island Copper	BHPBilliton Base Metals.	4,220,766.81	4,637,000.00	416,233.19
Kitsault	Avanti Kitsault Mine Ltd.	1,770,000.00	1,400,000.00	0.00
Highland Valley Copper	Teck Highland Valley Copper Ltd.	18,250,000.00	303,416,000.00	285,166,000.00
Brenda	Glencore Canada Corp.	5,000,000.00	30,166,667.00	25,166,667.00
Cassiar	Cassiar-Jade Contracting Inc.	600,000.00	530,000.00	0.00
Myra Falls	Nyrstar Myra Falls Ltd.	73,280,794.00	130,341,772.00	57,060,978.00

Copper Mountain	Copper Mountain Mining Corp.	8,000,500.00	7,040,000.00	0.00
Bul River	Bul River Mineral Corp.	491,511.19	470,747.00	0.00
Bell	Glencore Canada Corp.	25,100,000.00	13,879,331.00	0.00
Gibraltar	Gibraltar Mines Ltd.	49040989	41300000	0.00
Giant Nickel	Barrick Gold Inc.	27000	8223586	8,196,586.00
Silvana	Klondike Silver Corp.	150,000	175,000	25,000.00
Craigmont	Huldra Properties Inc.	700000	700000	0.00
Dolly Varden	Dolly Varden Mines Ltd.	6000	6000	0.00
Beaverdell	Teck Resources Ltd.	5000	10000	5,000.00
Mt. Copeland	KRC Operators	3484.1	3484.1	0.00
Sullivan	Teck Resources Ltd.	22500000	22500000	0.00
HB Mine	Teck Resources Ltd.	10000	10000	0.00
Dankoe	439813 BC Ltd.	10000	0	0.00
Boss Mountain	Glencore Canada Corp.	30000	833333	803,333.00
Afton	KGHM Ajax Mining Inc.	350000	350000	0.00
Equity	Goldcorp Canada Ltd.	87722000	87722000	0.00
Table Mountain	Cassiar Gold Corp.	264444	1898826	1,634,382.00
Mosquito Creek	Mosquito Consolidated Gold Mines Ltd.	5000	437119	432,119.00
Ladner Creek	New Carolin Gold Corp.	256250	660000	403,750.00
Scottie Gold / Summit Lake	Red Eye Resources Ltd.	15000	15000	0.00
Baker	Dupont Canada Ltd.	15606	165681	150,075.00
Goldstream	Barkerville Gold Mines Ltd.	200000	1125000	925,000.00
Venus	United Keno Hills Mines Ltd.	7000	7000	0.00
Taurus	Cassiar Gold Corp.	10000	628049	618,049.00



Silence Lake	Dimac Resources Corp.	10000	10000	0.00
Mt. Brussilof Magnisite	Baymag Mines Co. Ltd.	15101.71	831184	816,082.29
Ashlu Gold	Osprey Mining and Exploration Ltd.	10000	160000	150,000.00
Four-J / Lussier	Georgia Pacific Canada Ltd.	20000	45930	25,930.00
Union	Sumac Resources Ltd.	5000	1100	0.00
Blackdome	J- Pacific Gold Inc	100000	130000	30,000.00
Nickel Plate	Barrick Gold Inc.	1671754	140001129	138,329,375.00
Lawyers	Cheni Gold Mines Ltd.	1766	14400	12,634.00
Johnny Mountain	Skyline Gold Corp.	562310.33	6669700	6,107,389.67
Premier	Boliden Canada Ltd.	5000000	14650000	9,650,000.00
Parson Barite	Sherritt International Corp.	10000	83680	73,680.00
Candorado	Sunrise Resources Ltd	0	3000000	3,000,000.00
Samatosum	First Quantum Minerals Ltd.	7800000	7266667	0.00
Barrier Feldspar	Kanspar Industries Inc.	20000	0	0.00
Golden Bear	Goldcorp Canada Ltd.	210000	73200	0.00
Horse Creek Silica	HiTest Sand Inc.	125000	94873	0.00
Shasta	Sable Resources Ltd.	54147.86	1110000	1,055,852.14
Snip	Skeena Resources Ltd.	1750000	1813201	63,201.00
CIL	Clayburn Industries	1000	5000	4,000.00
Cirque	Cirque Operating Corp.	220000	220000	0.00
Eskay Creek	Barrick Gold Inc.	3774000	13005256	9,231,256.00
QR	Barkerville Gold Mines Ltd.	8750000	11368174	2,618,174.00
Elk/Siwash	Gold Mountain Mining Corp.	150000	61816	0.00
Mount Polley	Mount Polley Mining Corp.	31350611	39467061	8,116,450.00
Huckleberry	Huckleberry Mines Ltd.	32000000	46000000	14,000,000.00
Kemess South	AuRico Gold Inc.	38950000	45200000	0.00
Bralorne	Bralorne Gold Mines Ltd.	1365000	12300000	10,935,000.00
May Mac (formerly Bow Mines)	Golden Dawn Minerals Inc.	50000	94999	44,999.00
Ainsworth Mill	Bluebird Mining Ltd.	5000	250000	245,000.00
Lumby Mine	Saddle Mountain Minerals Ltd.	5000	5000	0.00
Max Molybdenum	Discovery Ventures Inc.	730000	1313403	583,403.00
New Afton	New Gold Inc.	9500000	14361702	4,861,702.00
Galore Creek	Galore Creek Mining Corporation	1167000	1167000	0.00

Ruby Creek	Global Drilling Solutions Inc.	100000	50000	0.00
Tulsequah	Chieftain Metals Inc.	1075015	1200000	124,985.00
Zip Mill	1086359 BC Ltd.	235000	202225	0.00
Lexington-Grenoble	1086359 BC Ltd.	215000	324558	109,558.00
Yellowjacket	African Queen Mines Ltd.	150000	105300	0.00
Mount Milligan	Terrane Metals Corp.	30000000	41868000	11,868,000.00
Dome Mountain	Gavin Minerals Ltd.	579000	13312503	12,733,503.00
Bonanza Ledge	Barkerville Gold Mines Ltd.	8300000	8326883	0.00
Treasure Mountain	Huldra Silver Inc.	505100	500000	0.00
Red Chris	Red Chris Operating Corp.	12000000	17055921	5,055,921.00
Yellow Giant (Tel)	Banks Island Gold Ltd.	214315	2273123	2,058,808.00
Silvertip	Coeur Silvertip Holdings Ltd.	18179000	12096385	0.00
Brucejack	Pretium Resources inc.	22700000	17993224	0.00
<b>Total</b>		<b>1,556,753,935.00</b>	<b>2,767,093,376.10</b>	<b>1,210,339,441.10</b>

## **Office of the Chief Inspector of Mines**

Health, Safety and Permitting Branch  
Ministry of Energy, Mines and Petroleum Resources

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