

2019

Toward a Safe Day Every Day

**Results from the 2018 Canadian
Mineral Exploration, Environment,
Health & Safety Survey**



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Introduction

The Association for Mineral Exploration (AME) and the Prospectors & Developers Association of Canada (PDAC) present their 14th annual industry environment, health and safety report with findings from the 2018 Canadian Mineral Exploration Environment, Health and Safety Survey.

AME and PDAC reached a new record: 117 organizations responded – up from 88 respondents in 2017, and 74 in 2016. Although the survey is voluntary, it represents a cross-section of the environment, health and safety performance and practices of companies and government geological surveys active in, and supporting, exploration for metals, coal, diamonds and industrial minerals. We estimate that approximately 60% of exploration expenditures in Canada are captured through the survey.

The survey provides a snapshot of leading indicators related to environment, health and safety as well as a report of incidents throughout the year. It also continues to inspire the development of both AME and PDAC's safety workshops and initiatives.

AME and PDAC, together with the Canadian Diamond Drilling Association (CDDA) encourage all organizations active in mineral exploration to complete the 2019 survey. The participation of companies supporting exploration in addition to mineral exploration and mining companies is critical to the success of the survey. Starting in 2020, through a partnership with the CDDA, the survey form will include interactive tools so that companies can compare their results with those of the industry in general. The survey is available at explorationsurvey.ca.



HIGHLIGHTS

The survey covers 9.9 million hours of work – the equivalent of nearly 5,000 full-time employees (up from 9.5 million hours of work in 2017 and 6.0 million hours of work in 2016). Nearly all respondents continue to report having environment, health and safety programming, planning and reporting.

The average worker can expect to have a career in mineral exploration without a lost-time injury, and it is expected that 2018 will mark the seventh consecutive year of the mineral exploration industry lost-time injury frequency rate being below the rate for all Canadian industries – reported most recently as 1.58 new claims per 100 covered workers in 2017 by the Association of Workers Compensation Boards of Canada. However, the lost-time injury frequency rate *, while remaining low, has doubled from 0.30 to 0.61 between 2016 and 2018 based on survey responses.

**Frequency rates expressed throughout this report are expressed as the number of incidents per 200,000 hours, or 100 worker years.*



SAFETY REPORTING

The AME/PDAC survey focuses on the various practices in place taken prior to incidents happening. These leading indicators, or proactive measures, vary according to the organization. Nearly all companies report having a health and safety program – compared to just under half when the national survey was launched in 2005. Of respondents, 96% report having a health and safety policy, up from 91% in 2017.

AME and PDAC continue to encourage safety discussions at both the staff and Board level. Overall, 67% of companies reported always discussing safety at the Board level and 76% reported discussing worker safety at every meeting. Although discussions of safety at every worker meeting appear to have become more frequent over the years, from 56% in 2012 to 76% in 2018, discussions of safety at Board meetings have generally not become more frequent (66% in 2012 and 67% in 2018). Notably, however, all 21 major companies surveyed reported having safety discussions at every Board meeting, compared to 75% of drilling companies, 60% of junior companies and 50% of other organizations (including geological surveys and service providers).

For the first time, organizations were asked whether they had a return to work policy, and 62% reported always having a return to work program for workplace injuries, 26% sometimes did and 7% never did. The percentage was highest among drilling companies at 92%, followed by 86% at majors.

PERCENTAGE OF COMPANIES WITH HEATH & SAFETY PROGRAM

(Respondents indicating “Yes” from 2005 through 2014; “Yes” or “Always” or “Sometimes” from 2015 through 2018)



ENVIRONMENTAL REPORTING

The percentage of companies reported having an environmental policy was 92% in 2018, up from 84% in 2017. The increase is likely due to increasingly robust due diligence required through legislation, permit requirements and consultation with Indigenous peoples. The percentage of organizations reporting having an environmental management plan in 2018 was 78%.

LAGGING INDICATORS

Lagging indicators are measures of actions taken after incidents happened.

The statistics below are based on descriptions of 886 incidents reported by 56 companies.

These include 564 incidents that resulted in injuries. Incidents – whether serious incidents or near misses, provide learning opportunities. For what is expected to be the seventh year in a row, the lost-time injury rate in the Canadian mineral exploration industry is expected to be below that of all industries in Canada. However, the lost-time incident frequency, while remaining low, has doubled from 0.30 to 0.61 between 2016 and 2018 based on survey responses.

With a recovery in the mineral exploration industry, the frequency rate of reportable injuries that results in the need for medical attention and/or a restricted work plan has also risen from 2.54 in 2016 to 4.22 in 2018. Part of the rise may be attributed to an influx of new workers into the industry. AME and PDAC encourage companies to recognize the importance of tracking and reporting near misses as learning opportunities in preventing more serious incidents.



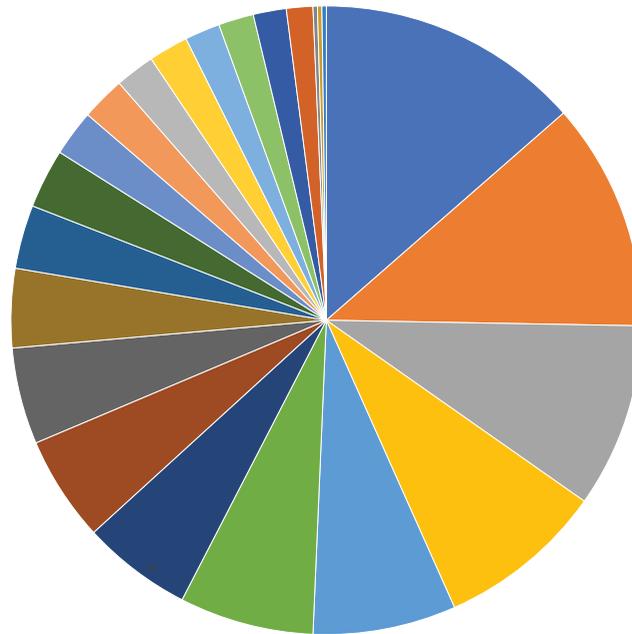
INCIDENT TYPE

Slips and falls accounted for 14% of incidents in 2018 (compared to 16% of incidents in 2017) and were the most common type of injury; these also accounted for 11, or 37% of lost-time incidents (essentially unchanged from 10 incidents, or 38% in 2017). These incidents continued to include falls from height where arrest mechanisms were not used and slips. In one case, a drill worker was struck while handling machinery on the roof of the drill, panicked and fell.



Drilling machinery was the primary type of incidents at 12% in 2018 (compared to 14% in 2017 and down considerably from 20% in 2016). There was only one lost-time incident resulting specifically from drill machinery use when a helper injured his hand while changing a hydraulic filter on a rig. It appears that thoroughly assessing the task beforehand may have prevented this injury.

Altogether, transportation accounted for 185, or 21% of, incidents. As several projects reported in the survey progressed to the mine development stage, on-site vehicles appear to have accounted for a greater share of incidents. In most cases, no injuries were reported, but three lost-time incidents involved vehicles, including one where a miner got a concussion when his head struck the ceiling of a truck while not wearing a seatbelt that was available.

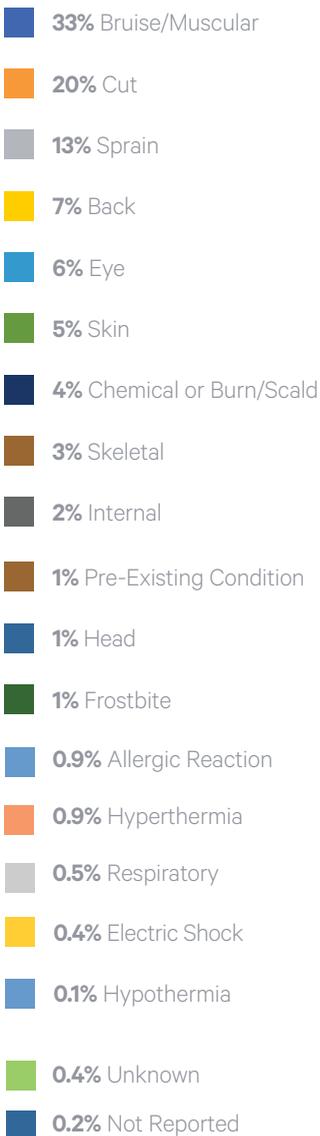


Key Takeaways:
Inspect all mobile equipment pre-use, perform preventative maintenance, and consider GPS and driver behaviour technologies in your mobile equipment safety program that can improve safety at your organization. Make sure that seat belts are used at all times when available.

NATURE OF INJURY

Of the incidents that did result in injury, bruises and muscular injuries accounted for 33% of injuries in 2018 (up from 28% in 2017, 24% in 2016 and 18% in 2015). The second leading form of injury was cuts, accounting for 20% (same as in 2017, but down from 24% in 2016 and 2015). Sprains accounted for 13% of injuries (down from 20% of injuries in 2017, 15% in 2016, and 20% in 2015).

No injuries were reported for 322, or 36%, of the 886 incidents reported through the survey; of these, nearly half were related to the environment or property damage. Although there appears to be more thorough reporting of incidents than in the past, there are far more injuries reported compared to near misses – 564 to 168 – or a 3:1 ratio. We expect that with more thorough reporting, the ratio would be reversed, and more importantly, the sharing of near misses among participants would lead to fewer incidents.

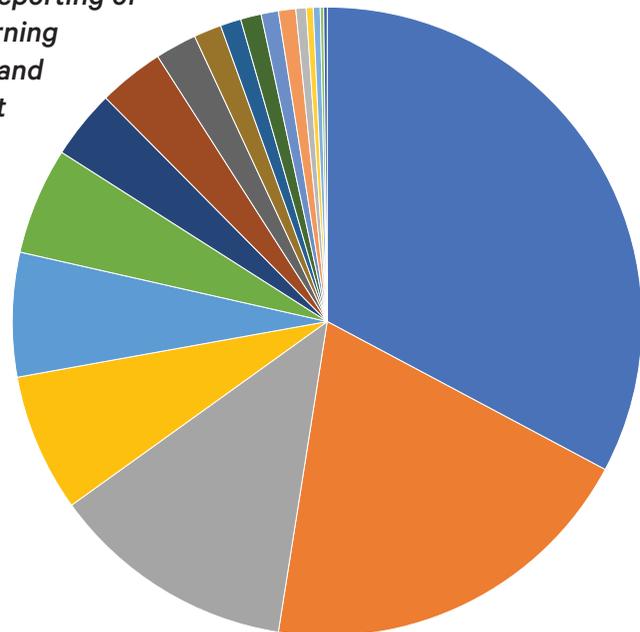


Key Takeaways:

Reduce muscular injuries and sprains by incorporating health and wellness into your safety program. Stretching should be introduced into the pre-shift toolbox meeting. Assess ergonomics for your work activities, ensure proper placement and storage of materials, and encourage micro-stretch breaks for repetitive tasks.

Ensure workers perform pre-task risk assessments prior to performing tasks. Workers should assess the appropriate level of PPE required for the task, which can include cut resistant gloves. Using the correct tools and ensuring that guards are in place will also reduce the risk of cuts and lacerations.

Encourage the reporting of incidents as learning opportunities – and a way to prevent injuries from happening.



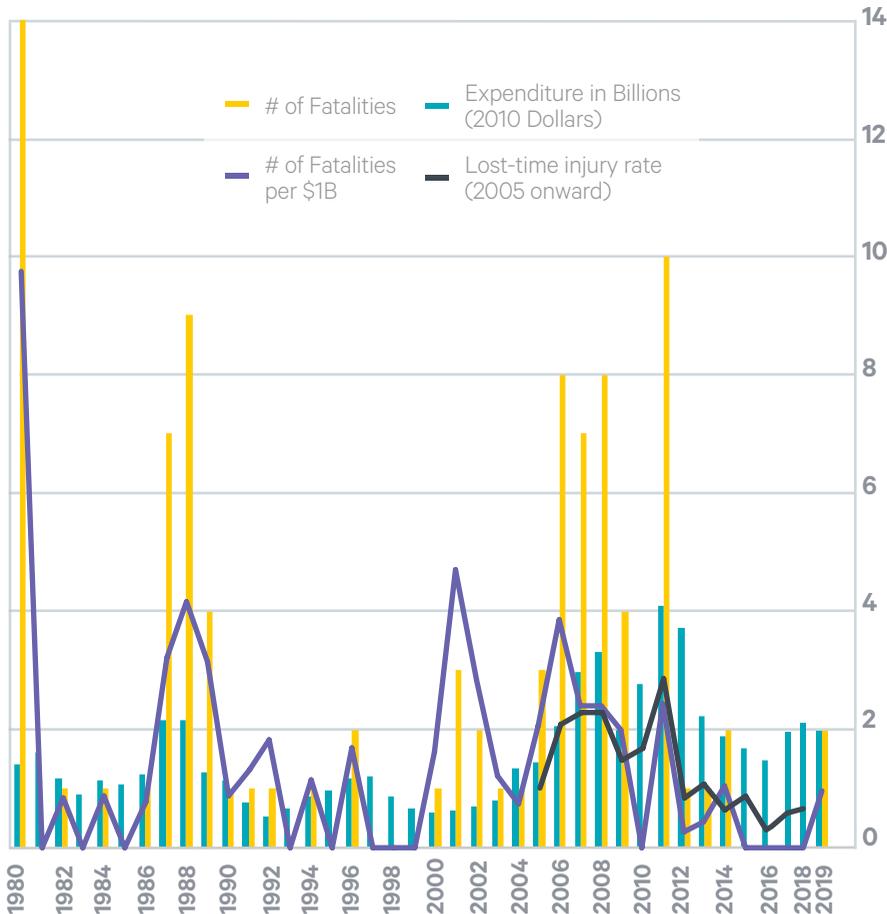
FATALITIES

AME and PDAC track fatalities and their causes separately from the survey. This information is derived from a combination of reporting through government-led investigations, communications with members, company news releases and news reports. The first fatalities in mineral exploration in Canada in five years occurred on August 6, 2019, when an airplane crash claimed the lives of the pilot and passenger in Yukon during a flight from a mineral exploration property to the village of Mayo. At the time of writing, an investigation by the Transportation Safety Board of Canada was underway. AME and PDAC are hopeful that this investigation will lead to recommendations that further improve aviation safety.

Altogether, there have been 98 fatalities in mineral exploration in Canada since 1980. However, there have been 13 fatality-free years – including a period of four years without a fatality from 2015 through 2018. Reported causes of fatalities, both primary and secondary, are listed below.

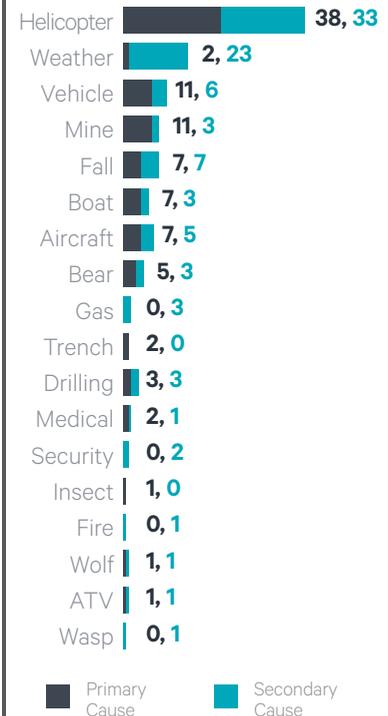
Historically, increased numbers and rates of fatalities and injuries have generally corresponded with peaks of activity in the industry. During extended downturns, companies have lost experienced workers and have often ramped up too quickly during upswings. This trend has generally decreased in recent years along with a combination of due diligence, learned lessons from past experience and a growing culture of safety and associated training.

FATALITIES IN MINERAL EXPLORATION IN CANADA 1980-2019



CAUSE OF FATALITIES 1980-2019

Transportation-related causes have either been primary or secondary causes of 68 or 69% of fatalities since 1980, and have been related to all but one of the 16 fatalities (94%) in the mineral exploration industry since 2010.



WHAT YOU CAN DO

- ▶ Ask questions about health and safety.
- ▶ If you are concerned, do not accept the status quo. It is every worker's right to refuse unsafe work.
- ▶ Before going in the field, take responsibility to seek out information - including resources from the PDAC and AME - available online free of charge.
- ▶ Provide or ask about resources for safety-related topics such as travel and transportation, proper lifting, drill equipment safety, proper footwear and working in icy conditions.

RESOURCES

SAFETY GUIDELINES AND MANUALS

The PDAC Field Safety Pocket Guide is available in English, French and Spanish. The guide includes a variety of safe fieldwork practices that will increase one's awareness of the risks, hazards and dangerous situations inherent in exploration work. The pocket guide is available from the PDAC; and more detailed information is available in the e3 Plus Health & Safety in Exploration Toolkit developed by the Health & Safety Committee of the PDAC. These resources can be downloaded at <https://www.pdac.ca/priorities/responsible-exploration/health-and-safety>.

A comprehensive source of safety information for mineral exploration focused on Western Canada is AME's Safety Guidelines for Mineral Exploration in Western Canada. The guidelines are available online at <https://amebc.ca/what-we-do/health-safety/> and from the AME office.

TOOLS

Helicopter slinging training is available for download at www.explorationsurvey.ca and viewable at https://amebc.ca/helicopter-training/story_html5.html.

AME and PDAC continue to develop new tools including AME's risk management training and PDAC's infographics (<https://www.pdac.ca/priorities/responsible-exploration/health-and-safety/health-and-safety-infographic>).

REPORTING

Download the Canadian Mineral Exploration Environment, Health & Safety Survey incident reporting form at www.explorationsurvey.ca.

OUR 2018 AWARD RECIPIENTS

SAFE DAY EVERYDAY GOLD AWARD

Congratulations to **Major Drilling** for achieving the third consecutive year of having the highest number of hours without a lost-time incident – at **1,200,066 hours in 2018 up from 1,001,838 hours in 2017.**

Rio Tinto Exploration Canada Inc. is also a recipient of the Safe Day Everyday Gold Award for achieving **206,411 hours** without a reportable injury. One of its contractors, George Downing Estate Drilling, had been a recipient of the Safe Day Everyday Gold Award for the previous year, 2017.

SAFE DAY EVERYDAY SILVER AWARD

42 organizations are presented with the Safe Day Everyday Silver Award for 2018, up from 35 in 2017. This award is presented to organizations reporting more than 10,000 hours throughout 2017 without a reportable injury.

Alexandria Minerals Corporation
Amarc Resources Ltd.
Amex Exploration Inc.
Avalon Advanced Materials Inc.
Barrick Gold Corporation - Hemlo
Operation
Benton Resources Inc.
British Columbia Geological
Survey
Brixton Metals Corporation
Cartwright Drilling Inc.
Century Wireline Services
Coast Mountain Geological Ltd.
Copper Mountain Mining
Corporation
CSA Global Canada Geosciences
Ltd.

De Beers Canada Ltd.
Detour Gold Exploration
Giga Metals Corporation
Globex Mining Enterprises Inc.
Golden Valley Mines Ltd.
Good Earth Drilling Services Ltd.
Harte Gold Corporation
Klondike Gold Corp.
Manitoba Geological Survey
Midland Exploration Inc.
North Arrow Minerals Inc.
Northwest Territories Geological
Survey
Orano Canada Inc.
Pure Gold Mining Inc.
Purepoint Uranium Group Inc.
Red Pine Exploration Inc.

Riverside Resources Inc.
RNC Minerals
Sabina Gold & Silver Corp.
Saskatchewan Geological Survey
Sirios Resources Inc.
Stornoway Diamond Corporation
Sun Metals Corp.
TECH Directional Services
Teck Resources Limited
UEX Corporation
Val-D'Or Mining Corporation
Victoria Gold Corp.
Wallbridge Mining Company
Limited

SAFE DAY EVERYDAY BRONZE AWARD

AME and the PDAC have awarded **52** organizations with the Safe Day Everyday Bronze Award for reporting a year without a lost-time incident in 2018, up from 35 organizations in 2017.

Abitibi Royalties Inc.	Forum Energy Metals Corp.	Pacific Empire Minerals Corp.
Accurate Mining Services Ltd.	George Downing Estate Drilling Limited	Pacific Ridge Exploration Ltd.
Agnico Eagle Mines Limited	Geotech Drilling Services Ltd.	Scott Hogg & Associates Ltd.
Altius Minerals Corporation	Glencore Canada Corporation - Zinc Golder	ScoZinc Mining Ltd.
Archer, Cathro & Associates (1981) Limited	Honey Badger Exploration Inc.	Sego Resources Inc.
Aurum Geological Consultants Inc	Hudbay Minerals Inc.	SLAM Exploration Ltd.
Barkerville Gold Mines Ltd.	Hy-Tech Drilling Ltd.	SSR Mining Inc.
Bayhorse Silver Inc.	JM Forestry and Exploration	Surge Copper Corp.
Burton Consulting Inc.	Lithos Geological Inc.	Taranis Resources Inc.
Cameco Exploration Department	MacDonald Mines Exploration Ltd.	Tchaikazan Resources Inc.
CANEX Metals Inc.	Margaux Resources Ltd.	Team Drilling
Capstone Mining Corp.	New Brunswick Department of Energy and Resource Development	Transition Metals Corp.
Centerra Gold Inc.	Nordgold	Trevali Mining Corporation
Denison Mines Corp.	North Coal Limited	Tri Origin Exploration Ltd.
Driftwood Diamond Drilling	Nova Scotia Department of Energy and Mines	ValOre Metals Corp.
Eastfield Resources Ltd.		Watts, Griffis and McQuat Limited
Eldorado Gold Lamaque		Yukuskokon Professional Services LLC
Evrin Resources Corp.		
Falco Resources Ltd.		

SAFE DAY EVERYDAY PARTICIPATION AWARD

Orano Canada Inc. (formerly AREVA Resources Canada Inc.) and **Wallbridge Mining Company Limited** are recognized for participating in the Canadian Mineral Exploration Environment, Health & Safety Survey for ten consecutive years.

Previous recipients of the Participation award who continued to participate in the survey include:

Altius Minerals Corporation (11 years)
Avalon Advanced Materials Inc. (13 years)
Benton Resources Inc. (11 years)
De Beers Canada Ltd. – Exploration (14 years)
Hy-Tech Drilling Ltd. (12 years)
Teck Resources Limited (14 years)
TerraLogic Exploration Inc. (14 years)



TOWARD A SAFE DAY EVERY DAY 2019: *Results from the 2018 Canadian Mineral Exploration Environment, Health & Safety Survey* is jointly produced by the Association for Mineral Exploration and the Prospectors & Developers Association of Canada.

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