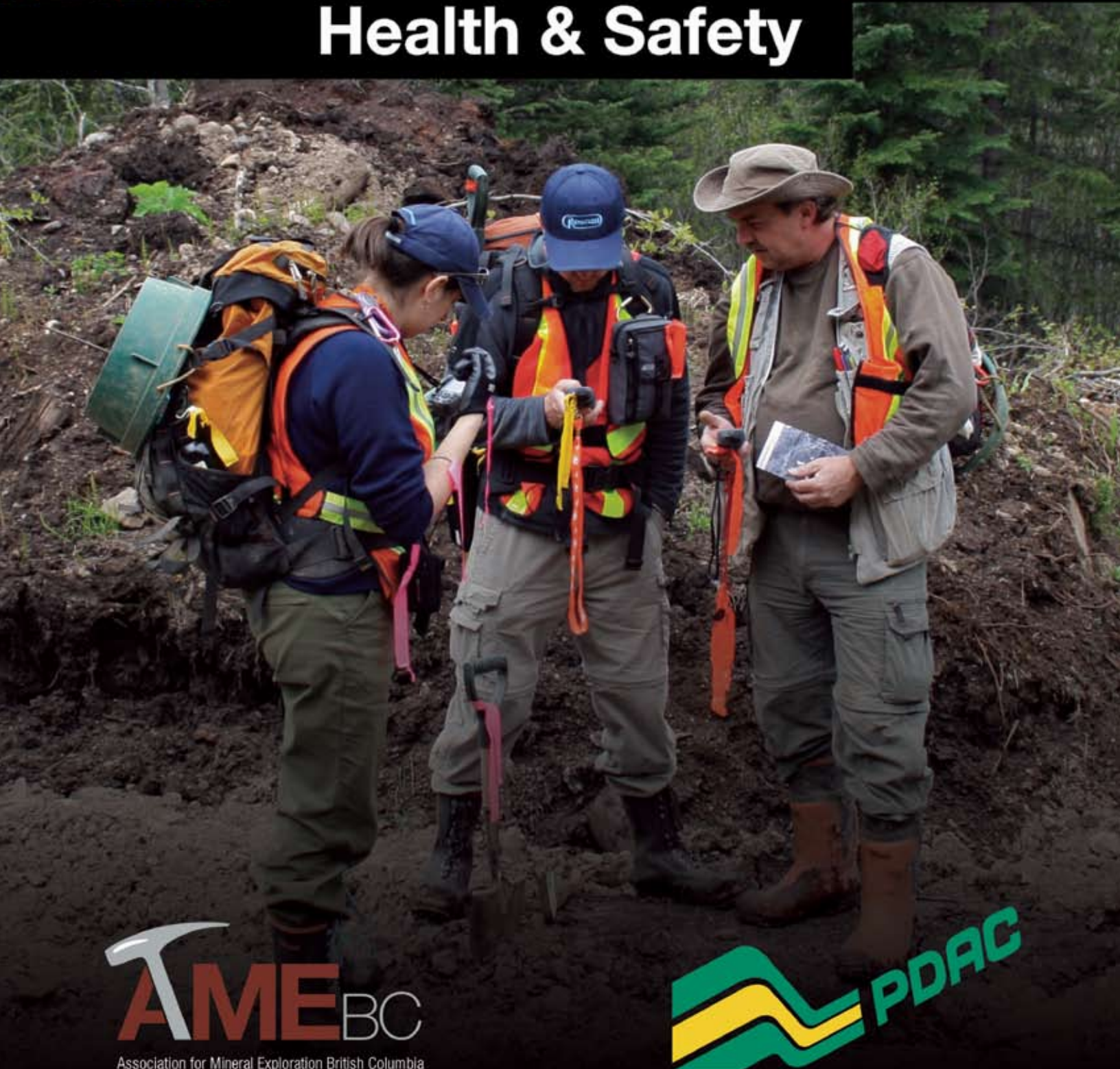




Canadian Mineral Exploration **Health & Safety**

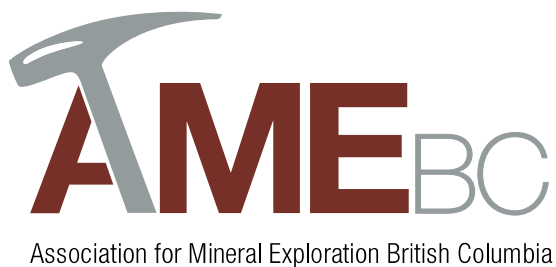


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Canadian Mineral Exploration Health & Safety

Annual Report 2007



November 2008

Re: Canadian Mineral Exploration Health & Safety Annual Report 2007

The Association for Mineral Exploration British Columbia (AME BC) and the Prospectors & Developers Association of Canada (PDAC) are pleased to present the third Canadian Mineral Exploration Health & Safety Annual Report. The objective of the report is to track health and safety trends and lay the foundation for increasing health and safety awareness and improving standards of practice in the mineral exploration industry.

This year, a record 94 companies active in mineral exploration in Canada took the time to analyze their health and safety performance and submit their results through a voluntary questionnaire. We congratulate the 65 companies who reported lost workday free records, and thank all survey participants for their commitment to the health and safety of their workers who carry out the drilling, map the properties, collect the samples, do the line cutting, provide transportation, and perform countless other tasks.

Sadly, five people died in five incidents during the course of mineral exploration work in Canada in 2007. Three people died in two helicopter crashes and two people drowned.

Survey participants reported 60 lost workday incidents, up from 43 lost workday incidents in 2006, and 328 incidents without lost workdays, down from 408 in 2006. The increase in incidents can be partly attributed to the increase in hours reported and very thorough incident reporting by many participants. AME BC and PDAC encourage all companies to set a target of zero incidents, every day. All companies should follow the guidelines contained in this report to help achieve this record.

All field employees and supervisory staff should take note of both the statistics and incidents detailed in this report.

We are very aware that of the 1,087 exploration companies contacted in the 2007 survey, we only received surveys from 101 (including companies inactive in Canada) and we would very much like to increase the participation rate. This survey relies on voluntary reporting from companies, and we are looking at ways to further encourage companies to report their 2008 activities as part of their Due Diligence.

We thank participants for their support and hope that you find the report of interest and value. If you have any suggestions for improvement of future reports please contact Jonathan Buchanan, Manager, Communications, at AME BC, at 604.630.3923 or jbuchanan@amebc.ca.

Yours truly,

Rob Pease
Health & Safety Committee
AME BC

Bill Mercer
Health & Safety Committee
PDAC



Canadian Mineral Exploration Health & Safety Annual Report 2007

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Acknowledgements

AME BC and PDAC thank the following for making the third annual *Canadian Mineral Exploration Health & Safety Survey* and *Annual Report* possible. Special thanks go to Dave Barr and the original Safety Committee of AME BC for developing the original *Annual Report: Safety in Mineral Exploration in Western Canada*.

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Executive Summary

The Association for Mineral Exploration British Columbia (AME BC) and the Prospectors & Developers Association of Canada (PDAC) have established goals of increased health and safety awareness, zero fatalities, and zero lost workday incidents. The associations are pleased to report that health and safety awareness among organizations involved in mineral exploration continues to increase. Furthermore, 65 organizations – 69% of those reporting exploration work in Canada – reported having no lost workday incidents. Sadly, however, five fatalities occurred in Canada in 2007 (down from eight in 2006). It is our hope that organizations nationwide learn from these fatalities and the 60 lost workday incidents reported by organizations as part of the *Canadian Mineral Exploration Health & Safety Survey*.

The survey, now in its third year, continues to have a relatively low response rate. Out of 1,087 organizations contacted, 101 companies (under 10%), filled out the survey. Of these, 94 organizations reported exploration work in Canada in 2007, an increase over the 88 in the 2006 survey and 76 in the 2005 inaugural year of the survey. Companies reported 538,868 person days of activity, up 30% from 415,125 days in 2006, but still fewer than 592,112 days reported in 2005. AME BC and PDAC thank the respondents of the survey for taking the time to volunteer this data to make the survey possible.

“Does your organization have a Health and Safety Program?” Out of 98 companies who responded to this question, 72 companies (73%) said yes. There has been a gradual improvement in the response to this question. Those saying yes accounted for 63% in 2006, 49% in 2005, and 43% in the 2004 survey conducted by AME BC of companies active in British Columbia and Yukon. New questions were added for 2007. Out of 99 companies, 89 reported discussing safety issues at staff meetings or holding safety meetings (90%), and out of 98 companies, 85 reported discussing recent near misses at staff meetings (87%). The ultimate objective is a sincere “Yes” in 100% of replies to all three of these questions.

There was an increase in the number of lost workday incidents reported, countered by a decrease in the number of incidents without injury. Survey participants reported 60 lost workday incidents, up 40% from 43 lost workday incidents in 2006. There were 328 incidents without lost workdays reported, down 20% from 408 in 2006. The increase in lost workday incidents can be partly attributed to the increase in hours reported and very thorough incident reporting by many participants. Companies reported a total of 6,504 lost workdays (including the equivalent of 6,000 lost workdays for one fatality reported – it must be noted that there were four additional fatalities in 2007 that were not reported through the questionnaire). The frequency of lost workday incidents per 200,000 hours was 2.3, up from 2.1 in 2006, and 1.0 in 2005.

There were 65 companies that reported operating without a lost workday incident, compared to 61 in 2006 and 71 in 2005. The number of days without a lost workday incident reported by some of these companies should serve as an inspiration to others. Alexis Minerals Corp. reported 46,050 days without a lost workday incident, followed closely by Northgate Minerals Corporation at 40,231 days, and De Beers Canada at 37,546 days. The records of the “Top 3” eclipse the previous record held by FNX Mining from 2005 at 30,533 days. (FNX Mining through 2007 has accumulated 68,768.9 days of mineral exploration work without a lost workday incident.) For a second consecutive year, De Beers Canada is the recipient of the Safe Day Everyday Gold Award (formerly called the Annual Safety Award), having recorded the most hours without a lost workday incident at 375,455 hours.

Sommaire

L'Association for Mineral Exploration British Columbia (AME BC) et l'Association canadienne des prospecteurs et entrepreneurs (PDAC) poursuivent les objectifs suivants : une plus grande sensibilisation à la santé et à la sécurité; aucune perte de vie et aucune journée de travail perdue. C'est avec plaisir que les associations déclarent que la sensibilisation à l'égard de la santé et de la sécurité parmi les organisations qui se spécialisent dans l'exploration minérale continue d'augmenter. De plus, 65 organisations – 69 % de celles qui ont fait état de travaux d'exploration au Canada – ont déclaré n'avoir perdu aucune journée de travail. Toutefois, cinq décès se sont malheureusement produits au Canada en 2007 (comparativement à huit en 2006). Nous espérons que les organisations à l'échelle du pays tireront parti de ces décès et des 60 incidents de jour de travail perdu relevés par les organisations par le biais du Canadian Mineral Exploration Health & Safety Survey.

Ce sondage, qui en est maintenant rendu à sa troisième année, continue de donner lieu à un taux de réponse relativement faible. Sur les 1 087 organisations sondées, 101 d'entre elles (moins de 10 %) ont répondu au sondage. De ce nombre, 94 organisations ont fait état de travaux d'exploration au Canada en 2007, ce qui représente une hausse par rapport à 88 organisations lors du sondage de 2006 et à 76 lors de la toute première année du sondage, à savoir 2005. Les sociétés ont signalé 538 868 jours-personnes d'activités, c'est-à-dire une augmentation de 30 % par rapport à 415 125 jours en 2006. Ce chiffre demeure toutefois en deçà des 592 112 jours déclarés en 2005. L'AME BC et la PDAC tiennent à remercier les répondants d'avoir pris le temps de communiquer ces données pour assurer la réalisation de ce sondage.

« *Votre organisation dispose-t-elle d'un programme de santé et de sécurité ?* » Sur les 98 sociétés qui ont répondu à cette question, 72 (73 %) d'entre elles ont répondu par l'affirmative. La réponse à cette question traduit une augmentation graduelle. Les organisations qui ont répondu par l'affirmative s'établissaient à 63 % en 2006, 49 % en 2005 et 43 % selon le sondage 2004 réalisé par AME BC auprès des entreprises actives en Colombie-Britannique et au Yukon. De nouvelles questions sont venues s'ajouter pour 2007. Sur 99 sociétés, 89 ont affirmé discuter des questions de sécurité lors des réunions du personnel ou tenir des réunions de sécurité (90 %), et sur les 98 sociétés, 85 ont déclaré avoir discuté de récents accidents évités de justesse lors des réunions du personnel (87 %). Le but ultime est un « oui » sincère à la totalité des réponses aux trois questions.

On a assisté à une hausse du nombre de jours de travail perdus qui ont été signalés, contrée par une baisse du nombre d'incidents sans blessures. Les répondants ont signalé 60 incidents de jour de travail perdus, soit une hausse de 40 % par rapport à 43 incidents de jour de travail perdus en 2006. On a signalé 328 incidents sans perte de jour de travail, ce qui se traduit par une baisse de 20 % comparativement à 408 en 2006. La hausse du nombre de jours de travail perdus peut être attribuée en partie à l'augmentation des heures signalées et aux rapports d'incidents très détaillés de nombreux participants. Les sociétés ont fait état d'un total de 6 504 jours de travail perdus (y compris l'équivalent de 6 000 jours de travail perdus pour un décès signalé – à noter qu'il y a eu quatre autres décès en 2007 qui n'ont pas été relevés sur le questionnaire). La fréquence de jours de travail perdus par 200 000 heures s'établissait à 2,3, soit une augmentation par rapport à 2,1 en 2006 et 1,0 en 2005.

Soixante-cinq sociétés ont déclaré avoir exercé leurs activités sans aucun jour de travail perdu, comparativement à 61 sociétés en 2006 et à 71 en 2005. Le nombre de journées passées sans aucun incident de jour de travail perdu qui ont été signalées par certaines de ces sociétés devraient servir de source d'inspiration aux autres. La Corporation minière Alexis a fait état de 46 050 journées sans aucun incident de jour de travail perdu, suivie de près par la Northgate Minerals Corporation, ayant enregistré 40 231 jours et De Beers Canada, 37 546 jours. Les records des « trois premiers » éclipsent le record antérieur détenu par FNX Mining depuis 2005, en l'occurrence 30 533 jours. (Jusqu'en 2007, FNX Mining a accumulé 68 768,9 jours d'exploration minérale sans incident de jour de travail perdu.) Pour une seconde année consécutive, De Beers Canada est le lauréat du prix Safe Day Everyday Gold Award (appelé précédemment Annual Safety Award), ayant enregistré le plus grand nombre d'heures sans incident de jour de travail perdu, à savoir 375 455 heures.

2007 in Review

Surface Exploration and Geological Work: A Summary

Respondents reported 239,639 person days of activity, up from 177,876 person days of activity in 2006, but still down from 337,556 person days of activity in 2005.

There was one fatality reported in the survey (three fatalities were not reported through the survey – see “Fatalities in 2007” on p. 18). A maintenance worker employed with a mineral exploration company drowned in the Northwest Territories in December 2007 when the truck in which he was riding broke through ice.

There were 28 lost workday incidents (21 requiring medical aid and 7 requiring first aid). These resulted in 6,258 lost workdays (the fatality represents 6,000 lost workdays; other incidents resulted in 258 lost workdays).

Lost workdays are centered around the support services required for exploration programs. It is worth noting that out of the 6,258 lost workdays (including the fatality), only 18 were attributed to geologists. A maintenance worker lost his life, field assistants lost 98 workdays, a line cutter lost 54 days, geophysicists lost 23 days, surveyors lost 9 days, a cook lost one day, and other employees and contractors ranging from helicopter mechanics to heavy equipment operators lost 55 days.

Not surprisingly then, the leading root cause of lost workdays was tool use. The misuse of axes and various saws used in exploration work led to five lost workday incidents. The other leading causes of incidents were slips and falls (traditionally the leading root cause), ATVs, medical conditions, and improper lifting leading to four incidents each. ATV incidents were attributed to improper maneuvering and excessive speed. In three of the medical cases, workers had pre-existing conditions, and in the other, a worker appeared to have a sore back toward the end of the job. Four incidents involved improper lifting. The leading preventive measures that could be taken to eliminate these incidents can be summarized as follows:

- 1) Eliminate unnecessary driving in hazardous conditions (e.g. driving on ice in the early season);
- 2) Train employees on ATVs if they are used in camp;
- 3) Ensure that employees disclose any pre-existing conditions that may affect their performance, and have the medication required if applicable; *and*
- 4) Do not lift heavy objects without assistance. Take the time necessary to obtain help.

The lost workday incident frequency rate (number of lost workdays per 200,000 exposure hours) was 2.3, up from 1.7 in 2006, and 0.5 in 2005.

Severity of injury rate (number of lost workdays per 200,000 exposure hours) was 523.5, down from 1,356.9 in 2006, a reflection of one less fatality. However, excluding the fatality, the rate would have been 21.6, up from 7.5 in 2006 minus that year’s fatalities.

Surface Drilling and Underground Exploration: A Summary

Together, surface drilling and underground exploration accounted for 291,633 person days, up from 237,249 person days of activity in 2006, and 254,557 person days in 2005.

The lost workday incident frequency rate was 2.2 in 2007, down slightly from 2.4 in 2006, but up from 1.7 in 2005. The severity rate for these activities was 17.1, a significant improvement from 32.5 in 2006 and 503.7 (32.3 excluding a fatality) in 2005.

No fatalities were reported in the survey (there was one driller fatality not reported through the survey – see “Fatalities in 2007” on p. 18).

Surface Drilling

Respondents reported 205,431 person days of activity. A direct comparison with 2006 is impossible as surface drilling, underground exploration, and other activities were lumped together in previous surveys.

There were 31 lost workday incidents (23 requiring medical aid and 8 requiring first aid), resulting in 172 lost workdays.

The leading cause of lost workday incidents was drilling machinery and equipment related. The use of drilling equipment requires the proper use of equipment and vigilance on the part of the operator. Twelve incidents resulted in 44 lost workdays and generally resulted from moving machinery, hits from winches or winch handles, and the misuse of pipe wrenches.

Slips and falls also continue to be of great concern and resulted in eight lost workday incidents totaling 66 lost workdays. Slips on drilling platforms and surrounding rock are unfortunately common injuries reported year after year in the survey.

Ten incidents resulting in 62 lost workdays resulted from ATV use (2 incidents), improper lifting (2), snowmobile use (2), automobile use (2), and falling objects during helicopter slinging operations (2). In these cases, training and proper care are vitally important in preventing further injuries.

Preventive measures to eliminate similar incidents in the future are:

- 1) Do not rush any aspect of a program, whether it is drilling or transportation. Train employees fully in all of their duties;
- 2) Ensure that the proper equipment is used in all drilling operations; *and*
- 3) Apply all preventive measures for surface exploration (see p. 5) to drilling operations as well.

The lost workday incident frequency rate per 200,000 exposure hours was 3.0, and the severity rate was 16.8.

Underground Exploration

Respondents reported 86,202 person days of activity. A direct comparison with 2006 is impossible as surface drilling, underground exploration, and other activities were lumped together in previous surveys.

There was only one lost workday incident accounting for 74 lost workdays. A miner was scaling loose rock at an underground exploration site in British Columbia, and fell forward from momentum, resulting in a separated shoulder. Scaling loose rock is an inherently hazardous operation; safe work procedures must be set and followed closely.

The lost workday incident frequency rate per 200,000 exposure hours was 0.2, an excellent record considering that the survey included multiple underground workplaces in five provinces and one territory. The severity rate was 18.2, identical to the rate for surface drilling.

Figure 1: Mineral Exploration Safety Statistics Summary 2007

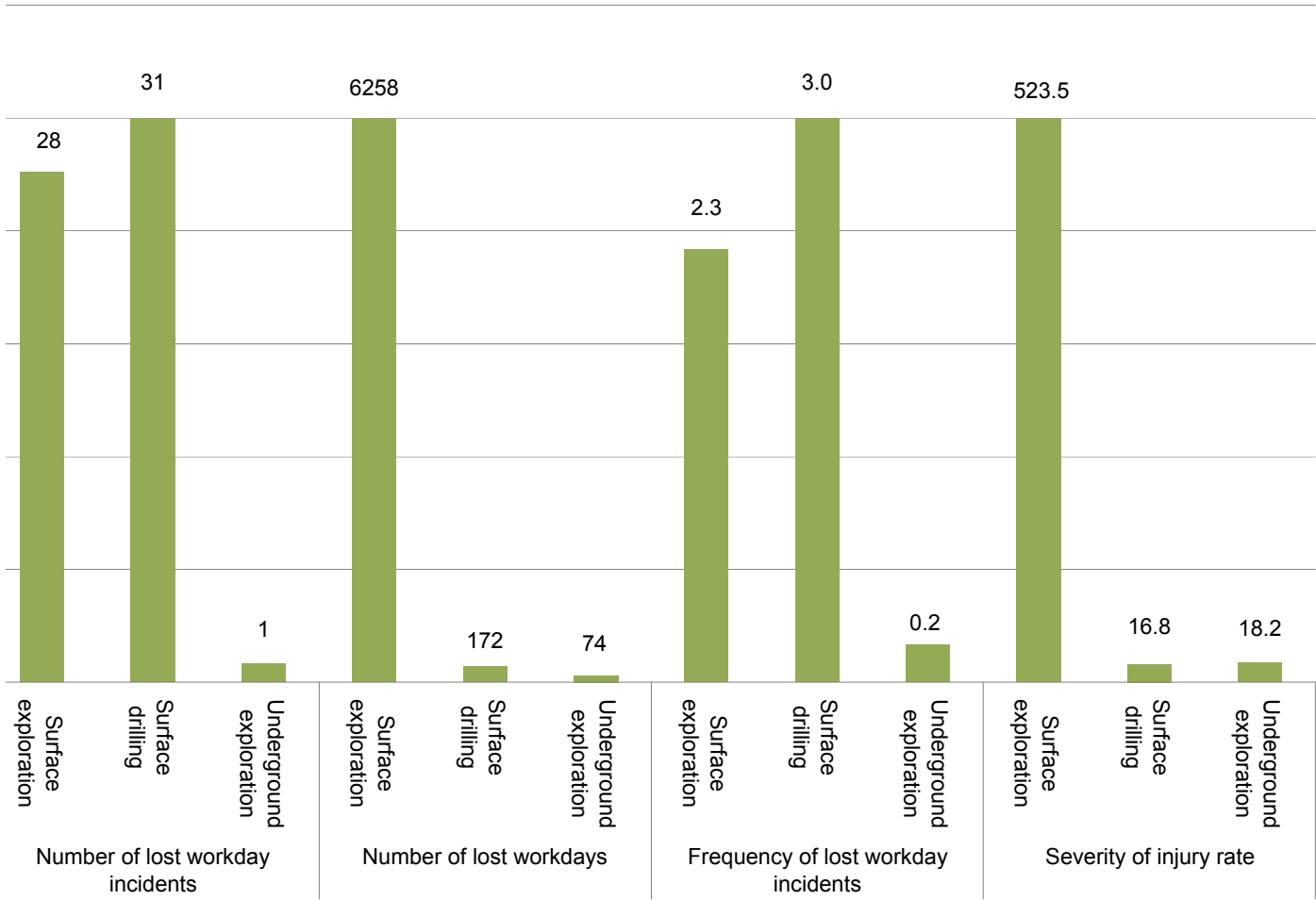


Table 1: Canadian Mineral Exploration Safety Statistics by Province and Territory 2007

Province	Category	NL	NS	NB	QC	ON	MB	SK	AB	BC	YT	NT	NU	N/A	Canada
Questionnaires returned from active companies		10	4	0	0	18	22	2	5	2	37	11	7	8	94
Person days of activity															
	Surface exploration	17,453	1,559	0	54,865	57,508	7,211	24,190	922	45,806	19,529	5,072	5,524	n/s	239,639
	Surface drilling	13,880	13	0	56,828	41,835	6,200	17,425	0	30,834	7,729	25,382	5,305	n/s	205,431
	Underground exploration	5,510	0	0	25,710	38,474	7,447	0	0	5,461	0	3,600	0	0	86,202
	Not specified													7,597	7,597
Total		36,843	1,572	0	137,403	137,817	20,858	41,615	922	82,101	27,258	34,054	10,829	7,597	538,868
	Surface exploration	174,530	15,590	0	548,650	566,068	72,110	241,900	9,223	461,616	195,290	50,720	55,240	n/s	2,390,937
	Surface drilling	138,800	130	0	568,280	404,348	62,000	174,250	0	311,246	77,290	253,823	53,050	n/s	2,043,217
	Underground exploration	55,100	0	0	257,100	333,740	74,470	0	0	54,610	0	36,000	0	0	811,020
	Not specified													75,965	75,965
Total		368,430	15,720	0	1,374,030	1,304,156	208,580	416,150	9,223	827,472	272,580	340,543	108,290	75,965	5,321,139
Equivalent no. of exposure hours															
	Surface exploration	0	0	-	0	0	0	0	0	0	0	0	0	0	1
	Surface drilling	0	0	-	0	0	0	0	-	0	0	0	0	0	0
	Underground exploration	0	-	-	0	0	0	0	-	0	-	0	-	-	0
Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fatalities															
	Surface exploration	3	0	-	2	2	2	2	0	6	8	1	2	2	28
	Surface drilling	1	0	-	3	1	1	3	-	12	8	1	1	0	31
	Underground exploration	0	-	-	0	0	0	0	-	1	-	0	-	-	1
Total		4	0	0	5	3	1	5	0	19	16	2	3	2	60
Workday Incidents															
	Surface exploration	6	0	-	22	31	0	11	0	84	23	6,000	9	72	6258
	Surface drilling	1	0	-	32	24	1	4	-	70	33	5	2	0	172
	Underground exploration	0	-	-	0	0	0	0	-	74	-	0	-	0	74
Total		7	0	0	54	55	1	15	0	228	56	6,005	11	72	6,504
Frequency of Lost Workday Incidents															
	Surface exploration	3.4	0.0	-	0.7	0.7	0.0	1.7	0.0	2.6	8.2	3.9	7.2	n/s	2.3
	Surface drilling	1.4	0.0	-	1.1	0.5	3.2	3.4	-	7.7	20.7	0.8	3.8	0.0	3.0
	Underground exploration	0.0	-	-	0.0	0.0	0.0	-	-	3.7	-	0.0	-	-	0.2
Total		2.2	0.0	0.0	0.7	0.5	1.0	2.4	0.0	4.6	11.7	1.2	5.5	5.3	2.3
Severity of Injury Rate															
	Surface exploration	6.9	0.0	-	8.0	11.0	0.0	9.1	0.0	36.4	23.6	23659.3	32.6	n/s	523.5
	Surface drilling	1.4	-	-	11.3	11.9	3.2	4.6	-	45.0	85.4	3.9	7.5	0.0	16.8
	Underground exploration	0.0	-	-	0.0	0.0	0.0	0.0	-	271.0	-	0.0	-	-	18.2
Total		3.8	0.0	0.0	7.9	8.4	1.0	7.2	0.0	55.1	41.1	3526.7	20.3	189.6	244.5

Definitions and notes for Table 1:

-**Frequency of lost workday incidents:** Number of lost workday incidents per 200,000 exposure hours.

-**Severity of injury rate:** Number of lost workdays per 200,000 exposure hours.

-Number of hours per day worked is 10 unless otherwise reported by participants.

-Number of lost workdays and severity rate incorporate time charge of 6,000 person days per fatality (American National Standard).

-Abbreviations: NL – Newfoundland & Labrador; NS – Nova Scotia; NB – New Brunswick; QC – Quebec; ON – Ontario; MB – Manitoba; SK – Saskatchewan; AB – Alberta; BC – British Columbia; YT – Yukon; NT – Northwest Territories; NU – Nunavut; N/A – not available; national data not separated according to province worked.

-Number of questionnaires per province/territory does not add up to Canadian total as many companies worked in multiple jurisdictions.

Discussion of Questionnaire Results

A total of 1,087 potential participants were contacted including mineral exploration and mining companies, consulting geologists, and government geological surveys. Of these, 101 responded, and 94 reported exploration work in Canada in 2007. The responses represent approximately 25% of the \$2.6 billion spent in 2007 on mineral exploration and deposit appraisal, as reported by Natural Resources Canada (Figure 2a).

There has been gradual improvement in responses more closely representing the scale of mineral exploration throughout Canada. However, we received no responses from New Brunswick and fewer responses from companies having large projects in Nunavut. We aim to strategically acquire responses that are more representative of the mineral exploration community in 2008.

Results of the survey for each province and territory are available in Table 1, and have been summarized in Figure 1.

The ratio of incidents without lost workdays to lost workday incidents has fallen precipitously from 10:1 to 6:1. We hope that one reason may be greater implementation of health and safety policies that prevent incidents from happening in the first place – 73% of respondents to the survey reported having a health and safety program, up from 63% in 2006, 49% in 2005, and 43% in the 2004 survey conducted by AME BC of companies active in British Columbia and Yukon. Furthermore, 90% reported discussing safety issues at staff meetings or holding safety meetings, and 87% reported discussing recent near misses at staff meetings. The ultimate objective is a sincere “Yes” in 100% of replies to all three of these questions.

Other reasons may include more stringent reporting of lost time (for example in the 2005 survey, one incident that was not calculated as lost time was a helper being lost in the tundra in Quebec for approximately four days). Finally, reduced reporting from contractors and subcontractors could be another cause.

Figure 2: Canadian Mineral Exploration Expenditures and Exposure Hours Reported to AME BC and PDAC

Figure 2a: 2007 Canadian Mineral Exploration Expenditures by Province

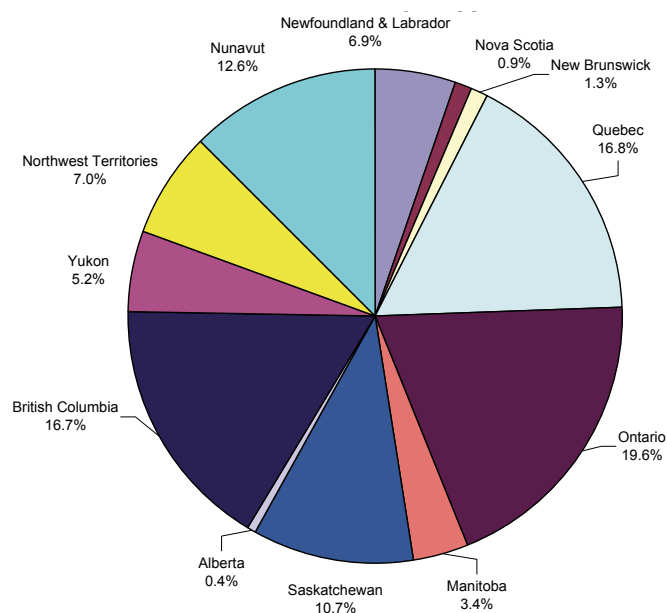
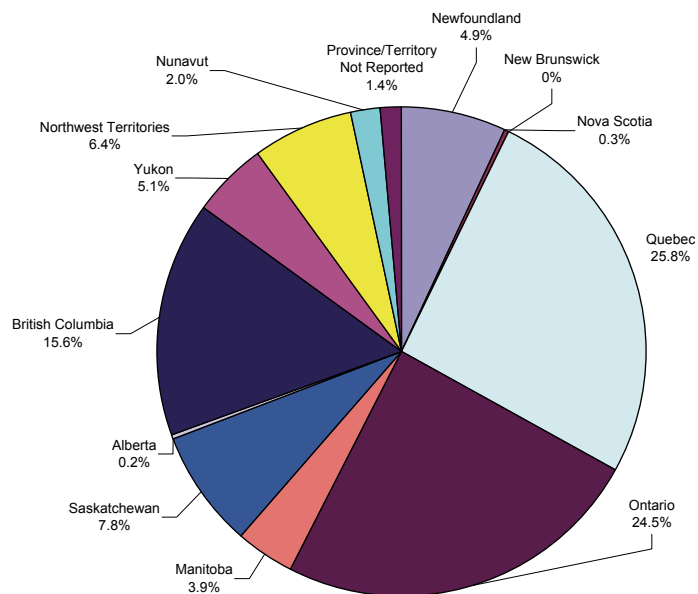


Figure 2b: 2007 Exposure Hours Reported to AME BC/PDAC



Cause of incidents

The causes of lost workday incidents are illustrated in Figure 3; the causes of all incidents are illustrated in Figure 4.

Figure 3: Cause of Lost Workday Incidents

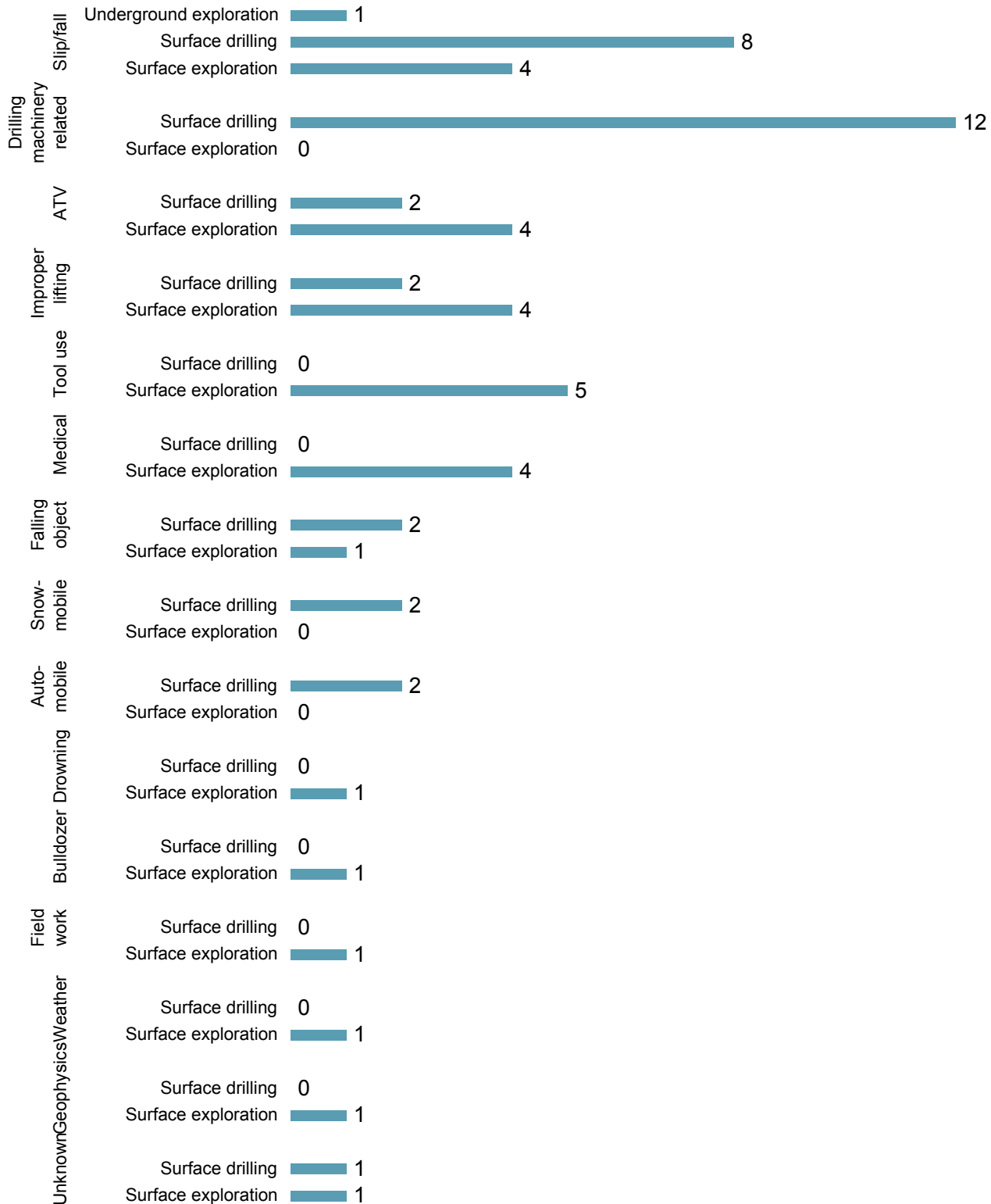
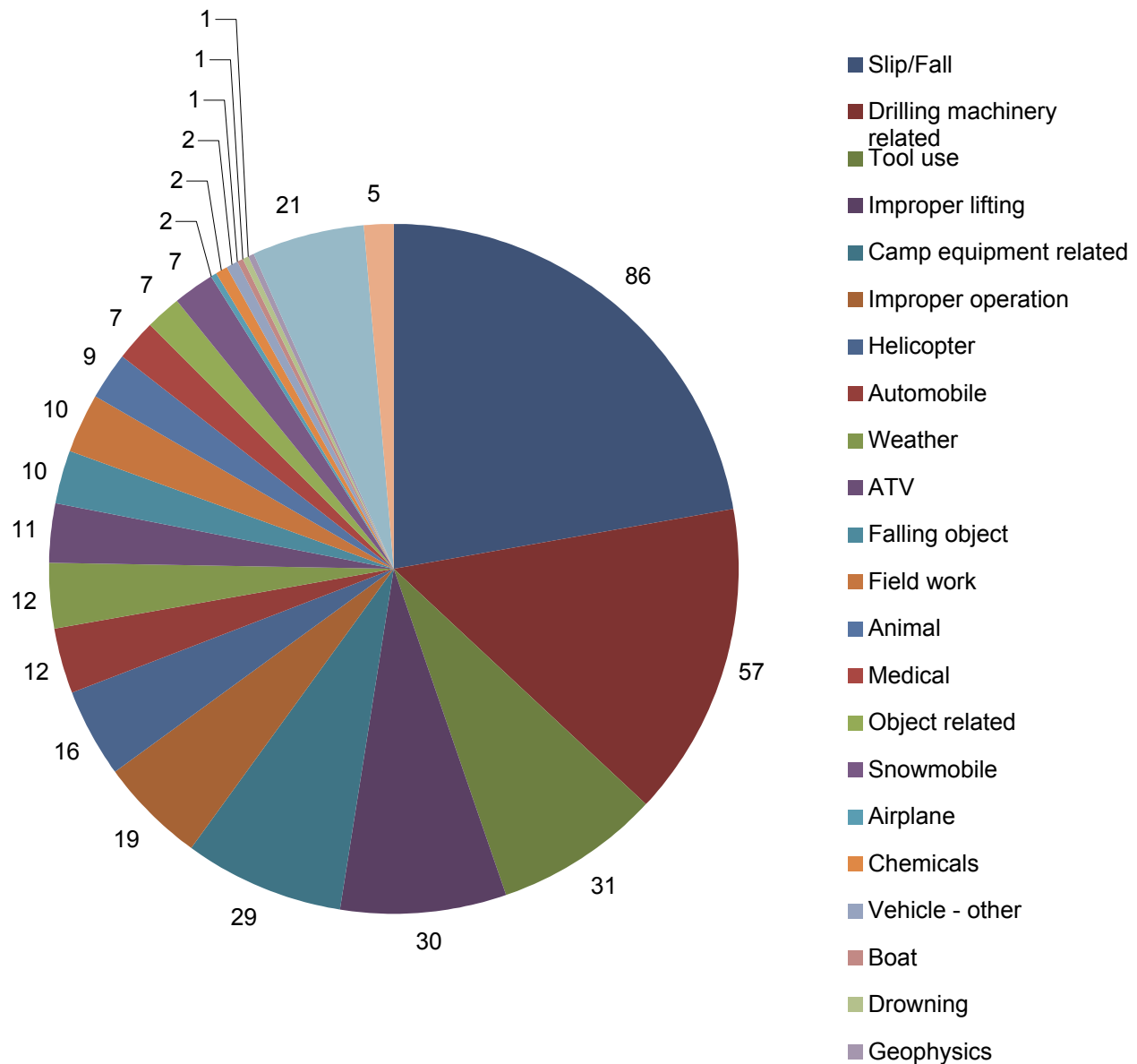


Figure 4: Cause of Incidents



Slips and falls are consistently the single leading cause of incidents. Mineral exploration activity presents a number of slippery surfaces (e.g. ice, wet drill decks, boulders) and opportunities for falls (e.g. uneven terrain including muskeg). Misuse of drilling machinery, tool use and camp equipment combined accounted for nearly one-third of incidents (117 incidents). A further 19 incidents could be attributed to improper operation – simply not following the procedures and policies already in place. Personnel should always use the required equipment properly – many cuts and other injuries are caused by using improper equipment or by not using caution when handling sharp objects or machinery.

Nature of incidents

The nature of lost workday incidents is illustrated in Figure 5; the nature of all incidents is illustrated in Figure 6.

In 2007, bruises and muscular injuries were the leading type of injuries, replacing the cuts as the primary type. Proper use of equipment and careful movement on slippery and uneven surfaces can prevent slips and falls, and therefore most bruise and muscle related injuries.

Cuts are almost always related to the leading causes of incidents: slips and falls, and misuse of tools and equipment. Bruises and muscular injuries were identified as the second leading source of incidents.

Details of lost workday incidents for surface exploration and geological work are tabulated in Table 2, and details for lost workday incidents for diamond drilling, underground work, and other activities are tabulated in Table 3. These tables clearly indicate the range of situations in which incidents arise, and provide anecdotal evidence of the importance of personal protective equipment, health and safety training, and due diligence.

Figure 5: Nature of Lost Workday Incidents

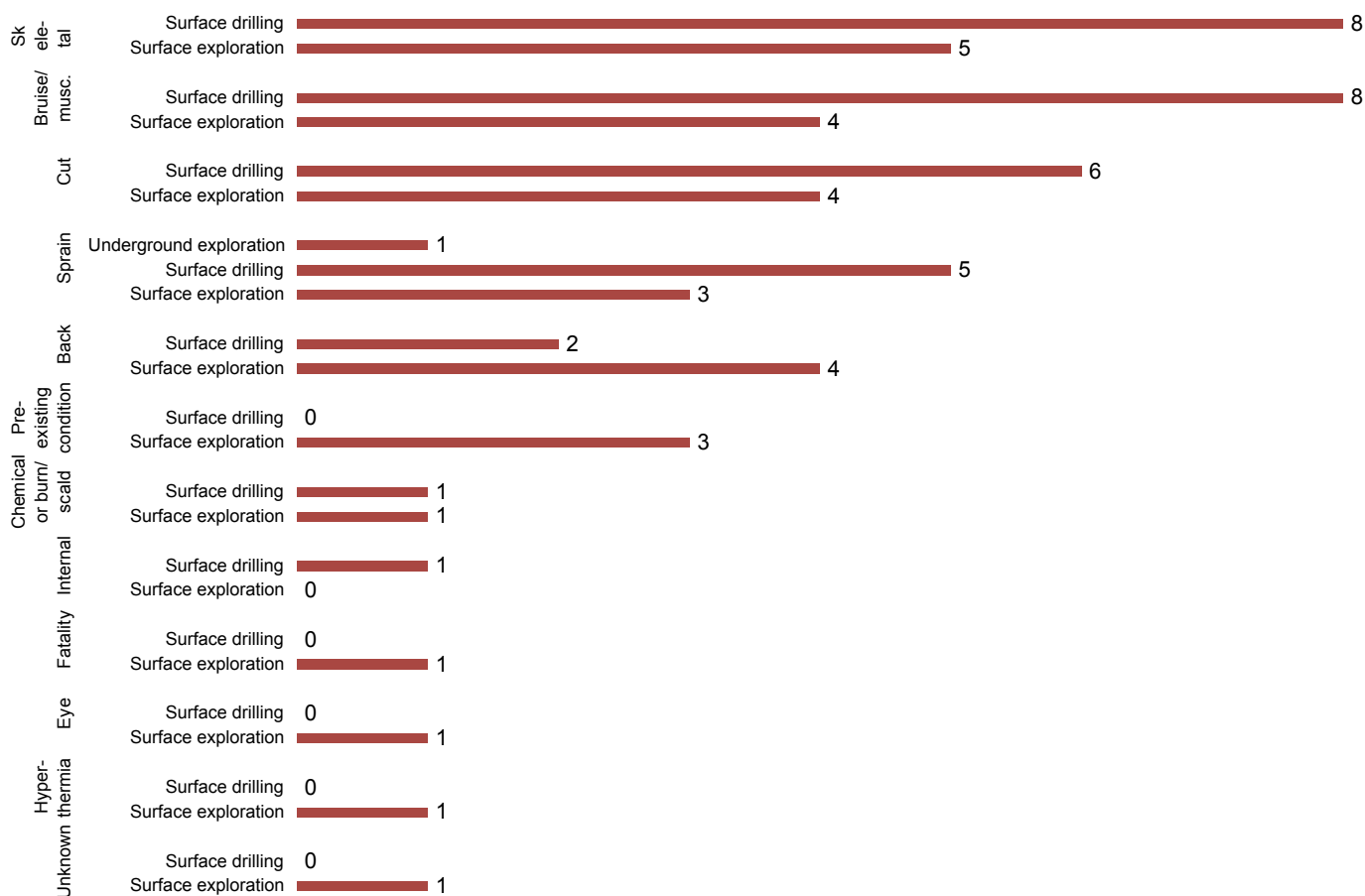


Figure 6: Nature of Incidents

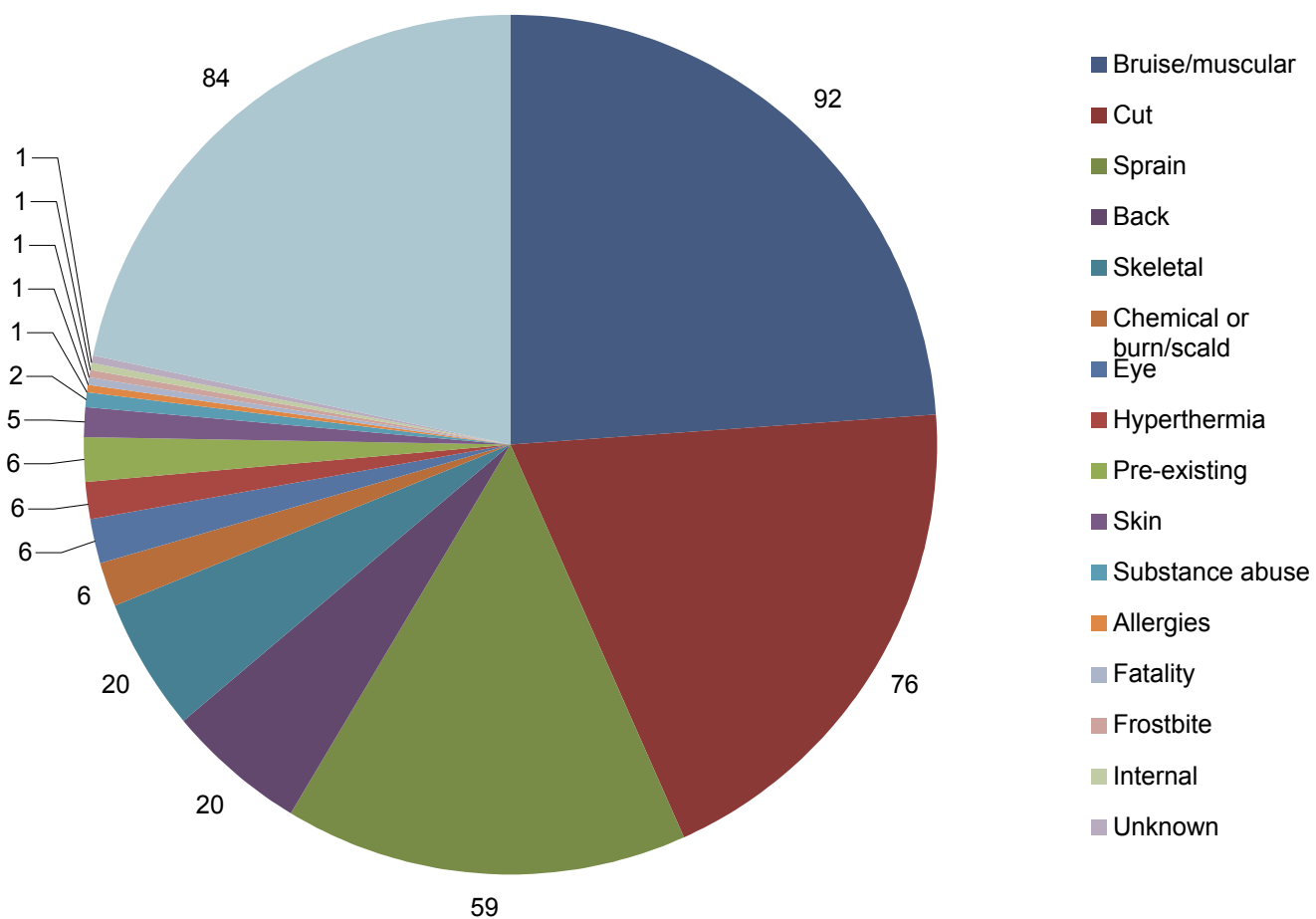
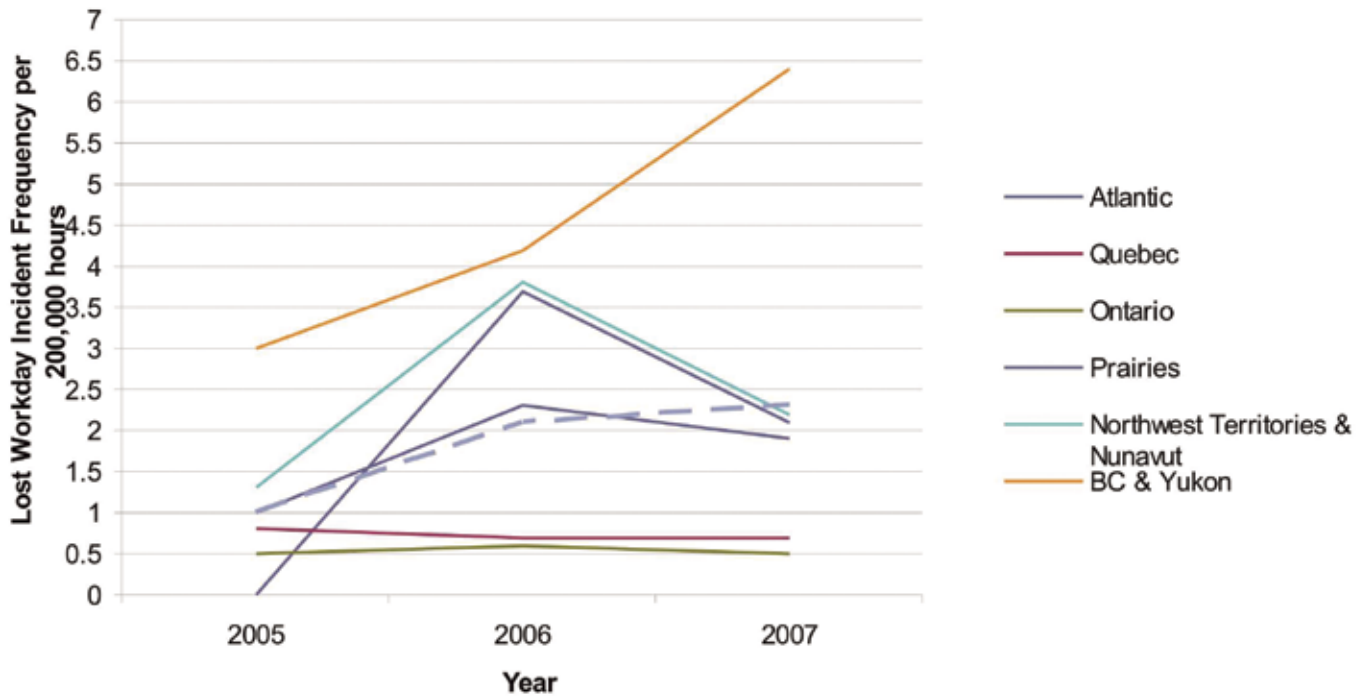


Figure 7: Annual Lost Workday Incident Frequency by Region



Trends

Figure 7 shows trends over the last three years in lost workday incident frequency. Ontario and Quebec have consistently had incident rates of less than one lost workday incident per 200,000 hours. The Prairies, Atlantic Provinces, and Far North saw their rates increase in 2006 but decline in 2007. The highest rates consistently belong to the Cordilleran region of British Columbia and Yukon. It appears that there are three main factors that can be attributed to the differences between geographic regions. Incident rates are:

- 1) Higher in rugged, remote areas requiring helicopter access
- 2) Lower in areas of brownfield exploration
- 3) Lower as variables are removed (e.g. weather, easily accessible infrastructure)

Figure 8: Annual Lost Workday Incident Frequency in BC & Yukon 1982-2007



Figure 8 shows trends in lost workday incident frequency in British Columbia and Yukon since the British Columbia & Yukon Chamber of Mines (now AME BC) began its *Annual Report: Safety in Mineral Exploration in Western Canada*. Generally, incident rates have been higher in times of high activity in the mineral exploration sector, although there is a very subtle downward trend overall. The incident rate peaked at 10.4 in 1991 and hit a low of 1.2 in 2002.

Conclusions and Recommendations

- Transportation related incidents continue to be the primary source of fatalities and major injuries in the mineral exploration sector.
 - Crossing ice, especially at the beginning of winter, must be done with extreme caution. Companies should have policies regarding the use of vehicles and equipment on ice.
 - ATVs must be used with extreme caution and at low speeds. Employees and contractors should be trained in their use (see *General Safety Guidelines* for more comprehensive guidelines).
 - Helicopter pilots and mineral exploration personnel must work together to ensure that rigorous briefings on helicopter safety procedures take place before commencement of operations and regular refreshers or safety meetings are arranged. When working around helicopters, unceasing vigilance is required by helicopter crew and exploration personnel. Slings operations, although vital to mineral exploration, are particularly hazardous.
 - Companies must ask to see the safety and maintenance records of any helicopter company they are considering for contract work and include this information as an important consideration in the choice of contractor.
 - Boats should be used with extraordinary caution, and operators should be properly trained in their operation. Operators of motorboats should also have a Pleasure Craft Operator Card – see www.tc.gc.ca/marinesafety/tp511/menu.htm. PFDs or life jackets (preferably the latter) must be worn at all times.
- Employers are legally responsible to ensure that all employees and contractors:
 - have safety programs in place;
 - provide personal protective and safety equipment;
 - adequately train and supervise personnel; *and*
 - ensure employees and contractors follow safe work guidelines.
- Employers are criminally liable under the *Criminal Code of Canada* for criminal acts or negligence in the workplace. For further information, visit www.ccohs.ca/oshanswers/legisl/billc45.html.
- Standardized drilling training such as the Ontario Common Core Training surface drilling training can improve the safety of drilling programs. For more information visit the Canadian Diamond Drilling Association website at www.canadiandrilling.com/training.html.
- As the ratio of incidents without lost workdays to lost workday incidents is over 6:1, incidents without lost workdays provide opportunities for companies to develop and improve their health and safety programs.

**Table 2: Lost Workday Incidents in Surface Exploration and Geological Work
2007 Summary Report**

Date	Prov/ Terr	Occupation	Type	No. of Lost Workdays	Nature of Injury	Cause of Injury	Description	Action Taken/Notes
Dec	NT	Other	MA	6000	Fatality	Drowning	Truck broke through ice and employee drowned.	Held meetings and grief counselling. Conducted policy reviews and changes.
Aug	BC	Field Assistant	FA	54	Back	Medical	Employee complained of a sore back as the job came to a close; there was no incident that led to the soft tissue injury.	
Jul	BC	Line Cutter	MA	54	Sprain	Slip/Fall	Worker slipped and fell, sliding approximately 10 metres down the hill. Hit hand and wrist on mossy rocky ground. This may have been an aggravated pre-existing injury; ice had been applied five days previously on the worker's wrist.	Following ice treatment and consultation between geologist and contractor's supervisor, worker was taken out of camp. Worker went to doctor with hand and arm swollen and bruised. Hand and arm were put in cast until swelling went down. Investigation is ongoing.
Aug	ON	Field Assistant	MA	30	Skeletal	ATV	ATV accident resulting in a crushed wrist. The field assistant was driving out of the bush at the end of the day on a familiar trail. The ATV was driven over a small rut in the road that lead to loss of control and the vehicle was driven into the ditch. The impact of the ATV hitting the ditch resulted in a broken/crushed wrist bone.	Immediate First Aid, called the police and took the injured worker to the hospital for first aid. Reported incident to the Ministry of Labour who subsequently investigated the accident. No charges were laid.
Sep	BC	Geophysicist	FA	18	Sprain	Slip/Fall	Walking down a hill on rough uneven terrain, the worker rolled his right ankle. The weight shifted forward, and the worker hyperextended his right knee.	The knee was iced and 3/4 splinted to immobilize the knee. Ibuprofen and Tylenol were administered for pain. The worker could do light work until sent out of camp to get X-rays.
Jul	QC	Geologist	MA	15	Skeletal	ATV	ATV accident of a trainee from Morocco on a large gravel road, due to a false manoeuvre	The person has been brought to the hospital and had an operation for a broken humerus. After that she worked at the Quebec office and had physiotherapy treatments.
Aug	BC	Other	MA	14	Skeletal	ATV	Going too fast on a quad and a roll over occurred	Increase training on quads and a lower speed limit for everyone
Jun	NU	Surveyor	FA	8	Back	Slip/Fall	Slip and fall; lower back injury.	Limited work load and rest the lower back.
Oct	YT	Other	MA	7	Skeletal	Vehicle - Other	Heavy equipment operator flipped DS CAT on uneven ground	Operator must survey before work
Jul	QC	Other	MA	7	Bruise/Muscular	Slip/Fall	Helicopter mechanic fell on ladder, bruised ribs and thigh, not following proper procedure	Safety meeting held; reminded all to follow proper procedure
Feb	SK	Other	MA	7	Pre-Existing	Medical	Loader operator came to camp with pneumonia and lung infection worsened.	Evacuated and sent to medical centre
Aug	YT	Other	MA	6	Back	Improper Lifting	Sore back	Rest
Aug	BC	Other	MA	6	Cut	Tool Use	Camp assistant cut while operating Skilsaw	Person transported to hospital for stitches
Aug	YT	Field Assistant	MA	5	Bruise/Muscular	ATV	ATV crash	Medevac from camp
Jul	BC	Other	MA	5	Bruise/Muscular	Improper Lifting	Tendonitis - pain, numbness and swelling in wrist - from repetitive lifting	
Mar	SK	Geophysicist	MA	4	Eye	Field Work	Eye injury from field work. Item removed, but had scratched cornea, resulting in blurred vision	Taken to doctor.
Sep	BC	Field Assistant	MA	4	Bruise/Muscular	Tool Use	Swollen finger from splitting blade; field assistant was not paying attention.	Medical attention from family doctor
Jul	NL	Field Assistant	MA	3	Cut	Tool Use	Axe cut	Medevac by helicopter for stitches
Aug	NL	Geologist	MA	2	Cut	Tool Use	Rock fragment cut left index finger while splitting core sample.	Bandaged wound and flew employee to town where wound was treated.
Aug	YT	Cook	MA	1	Pre-Existing	Medical	Carpal tunnel	Rest
May	ON	Field Assistant	MA	1	Hyperthermia	Weather	Worker suffered heat stroke; pre-existing medical condition a factor	Hospitalized overnight
Jun	YT	Field Assistant	FA	1	Skeletal	Falling Object	Flying rock	Cleaned and covered
Jun	YT	Geologist	MA	1	Cut	Tool Use	Cut from bow saw	Required stitches
May	NL	Geophysicist	MA	1	Chemical or Burn/Scald	Geophysics	Worker received an electrical burn when he came into contact with an energized geophysical wire	Person required to stay in town overnight before returning to work the next day
Mar	BC	Other	FA	1	Unknown	Unknown	Contractor was injured; did not return. Camp construction labourer tried to lift an object without assistance. Work crew was hurrying to keep up with helicopter slinging. Subject was medevaced for attention at Nursing Station. Subject had a pre-existing back condition that had not been reported to contractor.	Safety meeting emphasized need for workers to work in concert with others, not hurry and use proper lifting techniques at all times.
Apr	NU	Other	MA	1	Back	Improper Lifting	Twisted knee	Rest, Ice, Compression, Elevation
Jun	YT	Other	FA	1	Sprain	Improper Lifting	Twisted knee	Rest, Ice, Compression, Elevation
Jun	YT	Surveyor	FA	1	Pre-Existing	Medical	Epileptic with many years of experience ran out of medication in late morning.	Planned to return to town next day
TOTAL LOST WORKDAYS				6258				

**Table 3: Lost Workday Incidents in Surface Drilling and Underground Exploration
2007 Summary Report**

SURFACE DRILLING								
Date	Prov/ Terr	Occupation	Type	No. of Lost Workdays	Nature of Injury	Cause of Injury	Description	Action Taken
Aug	BC	Driller	MA	40	Internal	Slip/Fall	Fell off of a rod rack and collapsed his right lung	Was given time to recuperate and was given closer job site locations
Dec	ON	Driller Helper	MA	24	Skeletal	Snowmobile	Worker fractured their ankle when they tried to prevent a snowmobile from rolling	Returned to work after over 1 month in total
Mar	QC	Driller Helper	MA	14	Back	Improper Lifting	Lifting casing. No automatic rod handler	Require automatic rod handlers on drills
Jul	QC	Driller Helper	MA	14	Skeletal	Drilling Machinery Related	Moving wire line on spooler with a hand held rod. Wire line broke and dragged rod down on machine crushing the hand	Require automatic wire line spoolers
Aug	YT	Driller	MA	5	Bruise/Muscular	Slip/Fall	Slipped on platform injuring body	Sent for medical aid
Jun	YT	Driller	MA	5	Skeletal	Slip/Fall	Slipped on platform and hit his head	Sent for medical aid
Jul	YT	Driller	MA	5	Cut	Drilling Machinery Related	Was not using required PPE which resulted in an infected sliver in the wrist	Sent for medical aid
Aug	NT	Driller	MA	5	Skeletal	Drilling Machinery Related	Inexperienced helper left pipe wrench on rods. When driller started machine, wrench spun on rods and broke driller's leg.	Medevac to hospital - 5 days lost time was due to end of contract shift in 5 days
Aug	BC	Driller Helper	MA	5	Back	Slip/Fall	Checking waterline in rough terrain. Slid on hard snow patch.	Additional training for working on steep slopes; more intelligent planning of waterline routes.
Aug	YT	Driller Helper	MA	5	Bruise/Muscular	Slip/Fall	Slipped on platform injuring arm	Sent for medical aid
Jun	BC	Driller Helper	MA	2	Skeletal	Drilling Machinery Related	Previous injury that may have been aggravated from lifting a drill rod. Worker did not return to work.	
Jun	BC	Driller Helper	MA	2	Skeletal	Drilling Machinery Related	Crushed finger with pipe wrench - lack of experience was a factor. Splitter did not return to work.	
Apr	YT	Driller Helper	FA	5	Bruise/Muscular	Drilling Machinery Related	Winch hit back of right hand	Hand was iced
Aug	YT	Driller Helper	MA	5	Cut	Drilling Machinery Related	Was not wearing PPE which resulted in an infected sliver in the hand	Sent for medical aid
Jun	BC	Driller	MA	10	Skeletal	Automobile	Truck rolled on steep road. Lack of training a factor.	Training, directive.
Mar	QC	Driller Helper	FA	4	Bruise/Muscular	Slip/Fall	Drill helper was getting off the tractor when he slipped and hit his knee	Anti-slip plates welded on tractor and 3 points of contact
Mar	BC	Driller	MA	3	Bruise/Muscular	Automobile	Two trucks collided on narrow icy road at 2 pm; driller injured ribs and head	Driller medevaced to hospital; stayed 24 hours to monitor for concussion
Jul	NU	Driller	FA	2	Sprain	Improper Lifting	Strained his back	First aid at camp
Mar	SK	Driller	MA	2	Sprain	Drilling Machinery Related	Impact injury from a high presure line seized drill swivel and dislodged pump.	Evacuated and saw a physiotherapist; no bones were broken.
Jul	YT	Driller	MA	2	Skeletal	ATV	Fell off ATV injuring shoulder	Sent for medical aid
Sep	BC	Driller	FA	2	Bruise/Muscular	ATV	ATV rollover at 10 pm	First Aid administered; sent to hospital for checkup; drill sent home as near end of rotation
Jul	BC	Other	MA	2	Cut	Falling Object	Helicopter down; wash caused objects to fall, injuring core cutter.	Person put on spineboard and taken to hospital
Aug	SK	Driller	MA	1	Cut	Falling Object	Dropped sling load of timber on foot, cut became infected	First aid at camp; became infected so taken to hospital
Jan	MB	Driller	MA	1	Chemical or Burn/Scald	Drilling Machinery Related	Worker received a steam burn to his face from a coil stove at a drill	Person required to leave site to see a doctor and then had to stay in town overnight before returning to site
Mar	SK	Driller	MA	1	Sprain	Drilling Machinery Related	Severe tendonitis resulted from lifting and twisting heavy HQ rods. Wrists became very swollen and stiff through repetitive strain.	Sent home to undergo physiotherapy.
Sep	BC	Driller Helper	FA	1	Sprain	Unknown	Tendonitis, possibly from previous staph infection	
Mar	NL	Driller Helper	MA	1	Cut	Snowmobile	Worker received a serious cut to his knuckle while working on a snowmobile engine	Person required to leave site to see a doctor then had to stay in town overnight before returning to site
Aug	BC	Driller Helper	FA	1	Bruise/Muscular	Slip/Fall	Lost hard hat on steep slope, chased after it, fell and dislocated patella.	None
Apr	YT	Driller Helper	FA	1	Bruise/Muscular	Drilling Machinery Related	Winch handle hit back of hand. 2 years experience, midnight.	Applied ice, rest half shift
Nov	BC	Driller Helper	MA	1	Cut	Drilling Machinery Related	Drill helper slipped and his hand went between the head (rotating) and the tower, causing a substantial cut.	Installed guard.
Aug	BC	Other	FA	1	Sprain	Slip/Fall	Experienced splitter stepped on rock, slipped, and twisted knee.	Keep paths clear of tripping hazards.
TOTAL LOST WORKDAYS				172				
UNDERGROUND EXPLORATION								
Date	Prov/ Terr	Occupation	Type	No. of Lost Workdays	Nature of Injury	Cause	Description	Action Taken
Oct	BC	Miner	MA	74	Sprain	Slip/Fall	Miner was scaling loose, and fell forward from momentum, separating shoulder.	Medical aid sought.
TOTAL LOST WORKDAYS				74				

Fatalities in 2007

Five persons died in the course of mineral exploration activities in Canada in 2007. Another person died in a tent fire at an exploration camp in British Columbia at the end of the exploration season. Only one of these incidents was reported as a result of the questionnaire. Two of the fatalities were in Saskatchewan, and there was one each in the Northwest Territories, Labrador, and Nunavut. All but the tent fire fatality involved water, and all persons were either directly or indirectly employed by junior mining companies.

This compares with a 2006 total of eight fatalities and a 2005 total of three fatalities.

Summaries of the fatalities are as follows:

Helicopter related fatalities

1. On July 1, 2007, a helicopter pilot and geophysical equipment operator died when their Eurocopter A-Star 350 helicopter crashed into Bernick Lake near Points North Landing in northern Saskatchewan. The aircraft was reported missing when it did not arrive, and appears to have crashed into a lake that was not on a direct flight path to the base.
2. On October 3, 2007, a Bell 206 that had recently refueled in Postville, Labrador, contacted a slung load underneath a second helicopter that was about to refuel. The pilot was employed by a junior mining company active in the area. The helicopter caught fire and crashed into the water.

Drowning Fatalities

1. On November 30, 2007, a driller contracted by a junior mining company drowned after falling through ice on a project in Nunavut.
2. On December 1, 2007, a mine maintenance worker employed by a junior mining company drowned when the truck in which he was riding fell through a weak spot in the ice. The driver and other passenger of the truck escaped with frostbite. The RCMP reported that the two company employees and contractor were scavenging wood for a fishing shack.

Camp Fatality

On November 8, 2007, a helper died in a tent fire at an exploration camp in Northern British Columbia following the exploration season. The fatality was not designated as a work-related fatality as it was in camp.

General Safety Guidelines for Mineral Exploration

Introduction

Safety is prevention of injury when exposed to danger. Most serious incidents are caused by failure to recognize a potentially dangerous situation and to take the necessary preventive measures. Promotion of safe working practices is the responsibility of all workers, management, and contractors in the mineral exploration industry. Employers and supervisors must provide information, instruction, supervision, and enforcement, when necessary, to protect employees' health and safety. It is also the responsibility of each and every employee to do their work in a safe manner and watch out for the safety of co-workers. It is in the best interests of all individuals to become as knowledgeable and self-reliant as possible regarding safety awareness.

Field supervisors, party chiefs, and crew chiefs should be thoroughly familiar with safe working procedures. Particular attention must be directed to workers entering the mineral exploration industry, specifically workers new to the labour force. It must neither be assumed that any hazard is obvious nor that any safety procedure is necessarily self-evident. Appropriate safety and first aid equipment and suitably trained personnel should be available at all worksites. Implementing onsite safety orientation followed by regular safety meetings and training in the safe use of equipment will help ensure safe work practices.

Workplace and Workforce

There are few occupations which expose individuals to such a variety of hazards as mineral exploration. Several characteristics of Canadian mineral exploration are probably unique to the industry and affect safety considerations and monitoring. The workplace ranges from alpine to near desert and arctic to temperate environments. It is often located in remote areas, far from hospitals or other medical facilities. The unwary could succumb to any one of 20 or more potentially fatal hazards including falls in crevasses or on rough to precipitous ground, avalanches or falling rock, hypothermia, hyperthermia, asphyxiation, exposure, drowning, lightning strikes, tree falls, animal attacks, wasp stings, and a variety of transportation and travel-related causes including aircraft, vehicles, and boats. Mineral exploration is a global industry, and exploration outside Canada presents additional risks, some of which are covered in “Travel and Transportation” below.

The statistics include a large number of students and other temporary personnel with little previous wilderness experience who often work alone or in small isolated groups. However, recent fatalities include a number of experienced pilots, drillers, and geologists – demonstrating that experience can lead to an increased tolerance of risks associated with mineral exploration, particularly helicopter travel.

Incident Alerts

Travel and Transportation

Many potential hazards are more life-threatening than others, particularly those of a travel-related nature. This relationship, although not widely known, has been recognized by several explorationists and is very evident from questionnaire-related safety statistics. The majority of fatalities have resulted from travel and transportation related incidents, including traverses. Helicopters have resulted in 28 fatalities since 1980, and boat-related incidents have resulted in six fatalities, caused by hypothermia and drowning. Vehicle-related incidents (both automobile and ATV) are often life threatening and account for six fatal incidents.

The increased involvement by Canadian geoscientists in foreign exploration projects presents additional risks. A tragic helicopter incident on March 24, 1994, took the lives of three prominent Canadian explorationists and two military pilots involved in an exploration project in Ecuador. This incident may be indicative of the different safety standards existing in developing countries which could affect the lives of Canadians. Guerrilla activity in the Philippines, during which Colin Spence was shot and killed by ground fire while airborne in a helicopter in June 1996, reveals the unanticipated risks of exploration work in politically unstable countries.

All explorationists have a responsibility not only for their own safety, but for that of their co-workers and those working under their supervision. In travel-related situations, would-be or actual passengers must be prepared to express their concerns in support of aborting any travel by air, land or water, whether planned or in progress, for safety reasons with the expectation that their concerns will be given unbiased consideration by management.

Four falls into crevasses in the last 40 years by exploration personnel not adequately equipped or trained in glacier travel have resulted in four fatalities. By contrast, a well-equipped and trained mountaineering expedition into the Mount McKinley area in Alaska experienced 70 falls into crevasses without loss of life.

Boats

Over the past few decades, the number two cause of fatal incidents in mineral exploration is drowning, although boats are not commonly used in exploration. Drowning has occurred due to falling from boats, where the risks are probably high due to workers encumbered by field clothing and equipment, not wearing flotation devices, and unable to swim in the cold water that is frequently encountered in Canadian lakes and rivers. Wearing a personal flotation device is essential. Drowning has also occurred as a result of falling in water from helicopter downing, and from falling through ice. Exploration companies conducting programs that involved travel over or drilling on ice should carefully research the safety aspects of working on ice prior to any program. In addition, workers should be trained and briefed on safe aspects of travelling over and operating on ice.

Helicopters

Helicopters were involved in two fatal incidents in the mineral exploration sector in Canada in 2007, killing three people. Sadly, six people have died in three incidents in 2008 to date as well. Since 1980, 28 people have been killed in such helicopter incidents throughout Canada – half of them over a three-year period from 2006 to 2008. Sixteen incidents involving no lost time were reported in 2007, up from four in 2006. Ten of these incidents involved improper sling or long line loading procedures, and in one incident a worker was placed on restricted duty for 13 days after being struck by loose plywood from the drill shack roof during landing.

For detailed safety guidelines, refer to the *AME BC Safety Guidelines for Western Canada*, and the Helicopter safety sticker and card. The guidelines and sticker are available online at www.amebc.ca/healthsafety.htm; hard copies are available from the AME BC office.

Toe-in Pick-up Guidelines

Shortly after a fatality during a toe-in pick-up in July 2006, AME BC issued the following guidelines for toe-in pick-ups:

- Toe-in pick-ups carry a higher degree of risk and should be avoided if at all practical. In the past, especially towards the end of the field season, field crews sometimes became less energetic and as a consequence progressively less consideration is given in looking for flat spots for conventional landings. More and more they expect the pilot to pluck them off almost any slope, regardless of risk. Crews should get in the habit of finding the best possible pick-up spot on flat ground with good approaches throughout the field season.
- The pick-up locations must be approved by the pilot – by radio if you have one. If you are not in radio contact with the pilot and if the helicopter does not land, it is because he or she does not like your choice of pick-up point. The pilot will go and find a good landing spot and you will have to walk.
- Toe-in pick-ups should only be done with experienced crews that have built up a solid working relationship with the pilot. If the pilot expects to do toe-in pick-ups he or she will have talked about it in advance at the safety briefing as well as prior to embarkation and disembarkation. If the pilot doesn't mention any preferences regarding toe-in disciplines then you should ask.

- If there are two or more people expecting to be picked up at a toe-in site, it is important that they are in a cluster in such a position that they can be in eye contact with the pilot. Remember - **“See the pilot see you.”** In most cases of toe-in pick-ups, the crew will be at right angles to the length of the machine and on the opposite side of the pilot. The pilot may prefer that all crew enter and exit on the opposite side from the pilot, to preserve weight balance.
- The crew will be crouched, hats removed, equipment stowed in pack and ready to move slowly and confidently one at a time into the machine with their packsacks when they get the nod from the pilot.
- Never walk upslope at a helicopter landing site – the reason is obvious. You should always be in a position to step up on the skid – never stepping down on the skid.
- A passenger who is present in the aircraft at a toe-in site can help those who are climbing aboard by arranging seat belts at readiness and lifting and stowing packsacks in the cabin.
- All movements around the helicopter should be done slowly and efficiently. Weight transfer onto a skid that is not grounded should not be sudden.
- Sometimes it may be necessary to move around to the other side of the machine to access a cargo door or get in at a door on the other side. This can be awkward and time consuming especially if the machine has an antenna at the front or the terrain is steep. Never duck under the tail boom – you will be well out of sight of the pilot and may get a hot exhaust blast if the machine is a 500D. Avoid going around to the other side of the helicopter if this is possible.
- **THE PILOT IS THE PERSON TO MAKE ALL DECISIONS WHEN IT COMES TO THE HELICOPTER AND ITS CAPABILITIES – NO EXCEPTIONS**

ATVs and Utility Vehicles

All-terrain vehicles (ATVs) were responsible for four lost workday incidents in 2005, one in 2006, and six in 2007. These 11 incidents accounted for 220 lost workdays. Five incidents occurred in Yukon, three in Ontario, two in British Columbia and one in Quebec. Four of the incidents involved rollovers. The following guidelines have been adapted from AME BC's *Safety Guidelines*.

- **Use four-wheeled ATVs only.** Three-wheeled ATVs have not been available in Canada and the USA for many years, but are often available in developing countries. Three-wheeled ATVs should not be used under any circumstances, as they have been responsible for many serious incidents. Consider using utility vehicles such as mules, bobcats or argos, as these are more stable, carry more people and cargo than ATVs.
- If ATVs are used in the field, we highly recommend taking a training program from Canada Safety Council certified instructors. For information and a free CD, see www.safety-council.org/training/ATV/atv.htm
- Always make a pre-ride inspection before you start the engine.

- Do not ride fast on unfamiliar terrain or when visibility is limited. Never ride headlong past your limit of visibility. It is sometimes impossible to see obstructions, holes, and depressions. Always exercise caution.
- If carrying loads or towing a trailer, follow the manufacturer's rated vehicle capacity for loads and speeds.
- Most ATVs are designed to be ridden only by the operator. Their design does not permit carrying a passenger safely, as attested by the many injuries experienced by passengers.
- In particular, avoid the more obvious pitfalls, i.e. steep, rocky or irregular slopes, unsafe speeds, and exceeding your physical capability in righting an overturned ATV.
- Wear a government-certified crash helmet, scuff-resistant clothing, gloves, and goggles or face shields.
- Ensure that all ATVs are insured. Check the insurance requirements in each province or territory - \$1,000,000 (minimum) in insurance is recommended.
- Ensure that all ATVs and personnel meet the current provincial or territorial legislation – British Columbia is the only jurisdiction in North America that does not license ATVs.
- No horse play or racing should be permitted – too many incidents have resulted.
- Loading and unloading ATVs from flatbed or pickup trucks can be hazardous. Make sure ramps provide good traction and are securely attached to the truck. ATVs may slide off when ramps are wet, muddy, or icy. Winch them on and off, if possible.
- Special hazards include the following:
 - Sprains or back injuries may occur when picking up a fallen ATV.
 - Burns may result from contact with exposed exhaust pipes.
 - Blind corners on narrow trails or roads may cause collisions with other vehicles or persons unless particular care is exercised – slow down!
 - Unless goggles are worn, overhanging branches may lead to serious eye injuries.
 - When crossing small streams, the depth of water and the type and condition of the banks and stream bed should be checked as they can cause spills.
 - Be aware of the possibility of fallen trees across your trail.
 - Be aware that ATV country is usually bear country – be bear aware.
- The ATV is a valuable aid to the prospector or geologist, and its limitations should be respected.

Bears

On the first day of the field season in 2006, a worker in Yukon was mauled and killed by a grizzly bear as he passed within five metres of two bear cubs. Bears also killed mineral exploration workers in 1987 and 2005.

The principal preventive remedies and recommended procedures in the event of encounters with bears include the following:

- Avoid encounters by awareness of areas where bears are present in large numbers.

- Conceal food odours at camps and incinerate garbage.
- Make noise while traversing (use cans of rocks, air horns, etc.).
- Be alert for bear signs.
- Be prepared for an encounter by taking training courses and reading relevant literature.
- Carry bear bangers or a canister of the bear repellent Counter Assault or an equivalent bear spray in a readily accessible location. (See **CAUTIONARY NOTE** below.)
- Have a firearm available at camp and knowledge where to shoot to kill or disable a bear in the event of an emergency. Experience in the safe use of firearms is essential.
- If an attack is unavoidable, be prepared to follow the recommended procedure to survive mauling. This may involve fighting off an aggressive predatory bear with anything at hand.

The use of bear spray is recommended in the event of an attack by a bear. In both 1993 and 1994, two individuals credited the use of bear spray in saving their lives, one of them being seriously injured during the encounter. Employees must practice with bear spray at the beginning of each season and be conscious of wind direction and the optimum distance for spray use. Also recommended is Gary Shelton's *Bear Encounter Survival Guide*, available in bookstores. Mr. Shelton also advocates the use of a firearm, which federal and provincial government agencies actively discourage field employees from carrying.

Further procedures are included in AME BC's *Safety Guidelines*. Two highly recommended videos entitled "Staying Safe in Bear Country" and "Working in Bear Country" were produced by Magic Lantern and are available through www.yukonbooks.com. The video "Bear Aware" and accompanying manual were produced for the BC Ministry of Forests and provide comprehensive background material. These are available from the Queen's Printer of BC at www.publications.gov.bc.ca. The government of Yukon bear safety website at <http://www.environmentyukon.gov.yk.ca/camping/bearsafety.php> and the University of Alberta Earth & Atmospheric Sciences bear safety website at <http://safety.eas.ualberta.ca/node/13> are also excellent sources of information.

CAUTIONARY NOTE: BEAR BANGERS MAY BE DEFECTIVE

Bear bangers, which are devices used to scare away bears, may explode prematurely during use, causing injury to the operator. These are small explosive cartridges which are screwed to the end of a pencil-sized launcher and activated by a trigger. Once activated, the bear banger is launched about 40 metres by a propellant, at which point the main explosive charge explodes with a loud noise.

Failed bear bangers have exploded within several feet of the launch tube, temporarily deafening the operator and presenting dangers of burns and shrapnel.

The bear banger is normally white coloured, sold in packages of six stored inside a clear plastic pouch, and has a shelf life of about two years. **All** of the devices that failed during use and testing had a **grey discolouration**, probably caused by the propellant leaking from within the cartridge. Any bear bangers showing evidence of discolouration should be safely discarded and replaced with new devices in a sealed package. The devices that failed were only one and a half years old, so it is important to inspect and test-fire all bear bangers.

It is also important to check the compatibility of cartridge and firing mechanism. A rim-firing cartridge will not be fired by a centre firing mechanism or vice versa. Always test fire in a safe place before use.

Please note that bear bangers are considered dangerous goods, and are subject to Transport Canada regulations. See <http://www.tc.gc.ca/CivilAviation/commerce/DangerousGoods/news/notices/15.htm>.

Slips and Falls

Slips and falls have caused over 40% of lost workday incidents reported in the AME BC and AME BC/PDAC safety reports. Two fatalities have occurred over the years, one from a fall on precipitous terrain and the other from a fall into a crevasse. Two other fatalities were directly related to vehicles: one to a fall from the back of a pick-up truck and another from crushing by an overturned ATV. Other fatalities not generally attributed to falls, but directly related, include falls into cold or fast-moving water from boats, which resulted in death from hypothermia and/or drowning.

In 2007, slips and falls continued to be the leading cause of incidents.

The principal preventive strategies are:

- Development and implementation of a safety-awareness attitude with a constant effort to recognize and avoid potentially hazardous conditions
- Adequate footwear with an emphasis on traction and support for most exploration work and hard-toe cover, as required
- Special precaution in winter conditions, particularly on drill sites

West Nile Virus and Sun Protection

Exploration personnel commonly work in environments where sunscreen and insect repellents have to be applied to avoid exposure to sunburn, skin cancer, and West Nile virus. In this type of environment, experienced workers generally wear long pants, long sleeved shirts, and a hat with a big floppy brim. This means that exposure to the sun and mosquito bites is limited to the neck and face and the backs of hands: lotion application is thus minimized.

Recent research (2007) has demonstrated that it is not advisable to apply insect repellent (DEET products) and sunscreen at the same time as, the repellent penetrates the skin in far greater amounts and the sunscreen loses some of its protective ability. High absorption of DEET by the body can lead to toxic effects leading to dizziness, rashes and headaches. If both sunscreen and repellent must be applied, it is recommended that the sunscreen be applied first and the repellent 30 minutes later. Use a product with 35% DEET or less.

Eye Injuries

Eye injuries seldom receive the attention they deserve – they are not fatal, and are not generally reported by the media. However, they are very serious in nature and are easily preventable. One company active in the United States noted that eye injuries and flushes were the most common injury on their drilling team, attributable to improper use of personal protection equipment, mainly using glasses instead of goggles.

In May 2005, a geophysical assistant in Nunavut removed his sunglasses throughout the day, leading to impaired vision resulting in two lost workdays. Also in 2005, a driller helper got a small splinter in the eye by using an improper tool, also resulting in two lost workdays.

In 2007, a geophysicist received an eye injury during field work. The cornea was scratched, leading to blurred vision and four lost workdays.

The following are guidelines from AME BC's *Safety Guidelines*. The guidelines can be summarized as, "Always wear the appropriate personal protective equipment."

- Wear safety glasses at all times while breaking or hammering rock, core splitting, blasting, using a chainsaw, or when visiting mining operations.
- Wear goggles or a face shield attached to a hard hat when hooking up helicopter sling loads.
- Wear safety glasses with wide shields or goggles when handling chemicals (e.g. battery acid) or corrosive materials (e.g. grout), boosting batteries, or using ultraviolet lamps for extended periods.
- Wear high quality polarizing sunglasses when working at high altitude, or on glaciers, snowfields, and water.

Wolves

In November 2005, a geological engineering student at the University of Waterloo was killed by wolves while walking near a remote exploration camp at Points North Landing near Wollaston Lake, Saskatchewan. A coroner's inquest in 2007 confirmed that this was the first documented case of a fatal wolf attack in North America.

Like other animals, wolves are attracted to garbage. It is recommended that camps incinerate garbage daily and remove the remains to a legal dump or bury them in a suitable pit that, when full, is at least one metre deep, and is allowed in the land use permit. The British Columbia Ministry of Environment recommends the following measures if a wolf is encountered (available at www.env.gov.bc.ca/bcparks/explore/misc/wolves/wolfsaf.html):

- Do not allow the wolf to approach any closer than 100 metres.
- Raise your arms and wave them in the air to make yourself appear larger.
- When in a group, act in unison to send a clear message to the wolves they are not welcome.
- Back away slowly. Do not turn your back on the wolf.
- Make noise. Throw sticks, rocks, and sand at the wolf.

Wasps

A geologist died suddenly in 1991 from a massive allergic reaction (anaphylactic shock) following a single wasp sting in a remote area. It is possible that the fatality could have been avoided had epinephrine been available for an immediate emergency injection. Other potentially fatal allergic reactions, some of which are extremely rare, can be caused by drugs (penicillin, codeine, aspirin, sulpha antibiotics, etc.), certain foods and plants, or other insect bites.

The principal preventive measure is an awareness of possible susceptibility to specific allergic reactions and the immediate availability of epinephrine (usually available as an auto-injector such as an EpiPen). Concerned individuals should consult a physician to determine whether they are allergic to epinephrine or other antihistamines. People with auto-injectors should carry them at all times and ensure that they have not expired. If they have a very serious allergy, they should carry more than one EpiPen, as one dose may not be sufficient. An EpiPen should also be included in first aid and survival kits. Co-workers should be instructed how to use the EpiPen in case the victim is unable to do so.

Resources

Safety Guidelines and Manuals

A comprehensive source of safety information for mineral exploration is AME BC's *Safety Guidelines for Mineral Exploration in Western Canada*. Although the booklet has a western Canadian focus, it is generally applicable throughout Canada, and copies of the manual have been provided to companies operating in the USA and Latin America. A fourth edition of *Safety Guidelines* was released in 2006, and over 25,000 copies have been distributed over the past 27 years. The guidelines are available online at www.amebc.ca/healthsafety.htm and from the AME BC office. AME BC members are entitled to one free copy. Additional copies can be purchased at a cost of \$5.00 each (plus shipping and GST).

AME BC and PDAC are collaborating on a comprehensive safety manual that will provide detailed procedures and guidelines, to be released in 2009.

Safety Checklists, Stickers, and Cards

AME BC has prepared safety checklists, stickers, and cards to assist in preparedness in the field. A general safety checklist, survival kit checklists, and procedures in the event of a serious incident or fatality are on pages 180 to 182 and 184 of the *Safety Guidelines*.

In 2006, AME BC prepared safety stickers, which have been sent to over 500 active mineral exploration companies. The waterproof stickers covering transportation safety, field work and traversing safety, communication, helicopter safety, and environmental considerations for drilling are available from the AME BC office or in Adobe Acrobat .pdf format at www.amebc.ca/healthsafety.htm. Laminated cards, which can be clipped to safety vests and jackets, are also available.

Workshops & Courses

Exploration Field Safety Awareness Workshop

The AME BC Health & Safety Committee holds an annual Health & Safety Exploration Field Safety Workshop in Vancouver. The workshops have been held since 1984, and annually since 2004. Topics covered have included the following:

Presentations:

- Introduction, Background, Statistics
- Health & Safety Regulatory Environment
- Mountain & Glacier Travel
- Aircraft Safety
- Driving and Vehicle Safety
- Bear Hazard Safety
- Emergency Response

Interactive Sessions:

- First Aid Equipment
- Traversing Equipment

Videos:

- Hypothermia – Outdoor Enemy #1
- Kick Backs & Safe Use of Chainsaws
- Bear Aware

The next workshop is scheduled for Saturday, March 28, 2009, at the Simon Fraser University Downtown Campus (515 West Hastings Street, Vancouver). Visit **www.amebc.ca** to register.

First Aid Training

All personnel involved in mineral exploration should have current First Aid training that is applicable to their work. This usually includes Level 1 or Standard First Aid and a transportation endorsement. In general, first aid training within a crew or camp must meet, and should exceed, local Workers Compensation Board requirements.

Highly recommended for all exploration personnel is a course on Wilderness First Aid designed to provide participants with the confidence and knowledge required to deal with basic emergencies in wilderness settings.

Wilderness First Aid Training

The PDAC Health & Safety Committee and the Ontario Prospectors Association jointly organize courses in wilderness first aid. Courses were first held April 19-20, 2008, in Thunder Bay and in Sudbury the week of May 20, 2008. The course is given by Sirius Wilderness Medicine. Please contact Saley Lawton at 416.362.1969 ext 225 or **slawton@pdac.ca** if you are interested in a course – it can be offered in locations throughout Canada depending on demand.

In Vancouver, a 40-hour course is offered by Wilderness Alert (1.800.298.9919; **www.wildernessalert.com**).

For courses on Occupational Health & Safety, please consult the following websites:

- Mines and Aggregates Safety and Health Association – **www.masha.on.ca/links.aspx**
- Canadian Centre for Occupational Health and Safety – **www.ccohs.ca**
- CanOSH – **www.canoshweb.org/en/training.html**
- websites of local postsecondary institutions

Information on additional resources is welcome; please contact AME BC or PDAC.

Health & Safety Policy Guidelines for Junior Mineral Exploration Companies

These guidelines are designed to assist boards of junior exploration companies in setting up effective health and safety policies and protocols within the company. The guidelines are not standards and are not exhaustive. AME BC and PDAC have set the targets of zero fatalities and lowered lost time accidents for the exploration industry. Companies that have health and safety programs are more likely to help industry achieve those targets.

1. DUTIES OF BOARD OF DIRECTORS

- The Board of Directors should ensure that a health and safety program is in place.
- It may be preferable to appoint one director who will monitor and report to the Board on health and safety implementation.
- Alternatively the company could strike a health and safety committee of the Board.
- The Chairman of the Board should initiate education for all Directors as to their responsibilities and liabilities with respect to health and safety in the workplace. This would include all of the following:
 - Understanding of federal Bill C-45, which contains Amendments to the Criminal Code affecting the criminal liability of organizations
 - Understanding of regulations for the area(s) in which the company operates, and those specific to mineral exploration and mining
 - Understanding of the policies of appropriate professional associations with respect to health and safety in the workplace
 - Training on response to serious accident at worksite, including emergency response, but also response to media questions
- The Directors of the company should have a high level understanding of the health and safety risks in company workplaces.
- The Board should be notified as soon as possible on all serious accidents in the workplace (medical aids, lost time injuries, fatalities).
- The Board should allot resources towards health and safety program in the company.
- The Board should ensure that the organization has a Health and Safety mission statement, policy, and plan that implements health and safety protocols and checks periodically that they are appropriate. There should be health and safety targets within the plan.
- The policy should be signed at least by the chairman and preferably the whole Board.
- Any mission statement or policy could be incorporated within a general corporate mission statement and/or policy with respect to sustainable development.
- Consider an external review of health and safety policies and procedures.
- Make sure all work places, irrespective of jurisdiction, have the same levels of health and safety standards.

2. REPORTING

- Board meetings should include a report on health and safety performance prior to technical reviews.
- The Board of Directors, the director, or committee appointed to monitor health and safety procedures, should review with the COO or equivalent the records of statistics.
- Statistics should include hours worked, near misses, first aids, medical aids as well as workdays lost, and fatalities.
- Statistics should be maintained with monthly or quarterly reports.
- Accident records should be detailed and signed. Actions taken subsequent to accidents should be recorded.
- The annual report of the company, any interim reports (quarterly reports) and the website should include a summary of health and safety performance, along with the health and safety policy statement.
- In case of serious accident, if the company does not have the capacity to investigate the causes itself, external auditing should be completed.
- Operating groups or project teams should be encouraged to have safety meetings as follows:
 - Prior to project reports;
 - Once a month; *and*
 - Short “Toolbox” or “tailgate” meetings each day at the worksite
 - Minutes should be kept for safety meetings.
- Documentation should exist at three levels – office, management and field.

3. TRAINING

- Train the Board in field health and safety risks and procedures (as well as social, community and environment).
- Put a training plan in place to ensure that all workers have appropriate training for the tasks to be completed.
- Have safety leadership training as well as task specific training.
- Do not allow work to start without training.
- Have workers sign that they have received training and safety manuals. Insist on signatures that manuals have been read.
- All workplaces must comply with federal and provincial regulations with respect to health and safety.

4. DUE DILIGENCE CHECKLIST

Questions the Board of Directors should ask the Chief Operating Officer, Vice President-Exploration, or equivalent.

- ☐ Do you have a corporate health and safety policy?
- ☐ Do you have a corporate health and safety plan?
- ☐ Does the Board understand its responsibilities and liabilities?
- ☐ Does the Board have appropriate insurance in place?
- ☐ Does the Board request a health and safety report from the COO or equivalent prior to other discussions?
- ☐ Does the Board of Directors annually audit the plan with the COO or equivalent?
- ☐ Is the audit documented in writing, signed and dated?
- ☐ Does the Board audit the plan in addition to the annual audit in cases of serious accident?
- ☐ Do all projects have a designated health and safety leader, manager or monitor (not necessarily a job title)? Is the person told to shut down work if it is unacceptably unsafe?
- ☐ Does the designated health and safety leader know who to report to in case of accident?
- ☐ Do all worksites (camps, drills, etc) and regional offices have a valid, tested emergency response plan?
- ☐ Does the response plan include immediate 24/7 communication with COO or equivalent?
- ☐ Are all contractors required to include health and safety to at least the company standards in contracts?
- ☐ Before work starts, has there been an assessment and documentation of the health and safety risks?
- ☐ Are workers inducted for health and safety prior to starting work and supplied with necessary personal protective equipment?
- ☐ Are all employees given the appropriate training for the tasks required?
- ☐ Who documents training, including names, dates and course topics?
- ☐ Are training records kept?
- ☐ Are employees and contractors given an appropriate health and safety manual?
- ☐ Do employees sign that they have read the manual?
- ☐ Is there auditing of the contractor's worksite and action taken if required?
- ☐ Are health and safety statistics kept?
- ☐ Are the statistics publicly released (minimum: annual report)?

Basic Emergency Response Plan Guidelines for British Columbia

AME BC has worked with the British Columbia Ministry of Energy, Mines and Petroleum Resources to develop a set of *Basic Emergency Response Guidelines*. The guidelines were released in May 2007. Please note that these guidelines are designed to complement the standards of the *Health, Safety and Reclamation Code for Mines in British Columbia*. The guidelines are not exhaustive and may require adaptation for use in other jurisdictions.

Introduction:

In developing an Emergency Response Plan for your operation in accordance with the *Health, Safety and Reclamation Code for Mines in British Columbia* (HSRC) some basic factors must be considered. This guide, although not all-inclusive, is designed to assist the Mine Manager or person in charge of the exploration site in developing a workable plan for an operation. Although operations may be similar, each operation is unique, and may have a different plan in place to accommodate the site, the type of operation, the personnel, the level of training available, transportation, climate, and equipment available on site.

The plan once completed must be filed with the Chief Inspector as per the HSRC.

Components of the Plan:

I: Mine/Operation Information:

The following list identifies basic information that should be in the plan as it applies to a mining operation:

Note: A Mine is a place as defined under the Mines Act R.S.B.C. c 1996 (updated to July 16, 2002). Sites where mechanical disturbance of ground and/or exploration drilling occur and any place defined as a mine by the Chief Inspector are included in this definition.

- Name of the Mine and the company with a mailing address and contact telephone numbers; (fax and e-mail if applicable)
- Name of the Mine Manager as appointed under the Mines Act
- Mine number and permit number
- Type of operation, i.e. underground, surface, quarry, exploration, sand and gravel, placer
- Location of the property (UTM or Latitude/Longitude)
- Number of employees on site, including management and contractors
- Accurate mine plans showing and identifying areas should be maintained on site and made available to responding teams, personnel, or agencies.

II: Hazard Analysis of Operation:

This section should identify all potential emergencies that could occur on the site. These emergencies may be broadly broken into five basic types. Each operation may choose to include more detail; others may break the five types into fewer or more than five types.

1. Fire/Explosion
2. Injury to workers
3. Environmental
4. Climate
5. Equipment failure

III: Emergency Equipment

In this section, list the emergency equipment available on site to deal with identified potential emergencies/hazard. Also include other sources of equipment that may be necessary. Some examples are:

- Fire pumps and extinguishers
- First Aid supplies
- Forest fire fighting supplies
- Rescue equipment (e.g. stretcher that can be fitted in helicopter or vehicle)
- Equipment that can be assigned to an emergency task (e.g. a dozer or excavator used to build roads and trails can be pressed into service to dam or dyke a flood).
- Industrial ambulance or emergency transport vehicle.
- Outside sources of specific equipment

IV: Trained Personnel

In this section, list the availability on site of trained personnel capable of dealing with the identified potential emergencies/hazards.

- Contact information for on site First Aid
- Identify other sources of trained personnel (i.e. back-up teams, other agencies such as local fire department, local search and rescue, and provincial ambulance)

V: Implementation of the Plan and Incident Command

Clearly define how persons involved in an emergency are to access and implement the plan: (*Preplan basic response guidelines based on hazard assessment*)

- First steps, including who to call and how to call, and when to call
- Identify who will be responsible for implementing the emergency plan.
- Identify who will be in charge of conducting the emergency operation.
- Define all communication systems to be used (i.e. two-way radio, cell phone, satellite phone).
- Assign tasks by function and how the function will be filled. Examples include:
 - call-outs and communication with other access road users including logging companies
 - arranging assistance from other agencies or operations
 - required notification (e.g. Mines Inspectors (Health and Safety), Provincial Emergency Plan personnel, etc.)
- Include an Emergency Notification and Mobilization Chart.

VI: Directions to Site:

Provide clear written directions to the site; include maps that can be used for navigation. This is particularly important in remote areas. If using a radio controlled logging road, include radio frequencies and call-out procedures.

For exploration sites, marshalling points should be established. Coordinates of such points should be provided, and helicopter landings areas should be identified or established

- Clearly define how these directions will be communicated to those who may not be familiar with the area or roads and are called in to assist.
- Identify who has been given copies of the directions in advance.
- On long road transport of injured workers, identify and mark on the map possible transfer sites for Provincial Ambulance.

VII: Contact Lists:

Set a stand alone page with all contact information for all agencies listed, in addition to Company contacts. The following is not all-inclusive.

- Mine Manager
- Corporate Head Office
- First Aid, phone, or radio channel
- Emergency personnel
- Outside agencies (Federal, Provincial, or Local Government contacts)
- Equipment suppliers
- Transport companies, including air service (float plane or helicopter)
- Back-up rescue team if applicable

VIII: Training

Include a provision for training all persons on site in the application of the plan.

IX: Records:

Supplementary to the plan are all the records associated with it. Therefore, the following records should be maintained on site.

- Training
- Equipment checks
- Implementation if applicable.
- Incident debriefing if applicable.

Conclusion:

This guide is not all inclusive, and must be adapted to each site according to the risk assessment. It is imperative that the Mine Manager update the plan as may be required, from time to time due to changes in personnel, equipment, mine plan changes, or locations. It is also good practice to test the emergency preparedness plan with all affected persons. In some cases, evacuation drills are required, and **if the site requires the evacuation drill, the evacuation procedure must be posted and communicated to all affected personnel.**

References:

Mines Act http://www.ap.gov.bc.ca/statreg/stat/M/96293_01.htm

Health, Safety and Reclamation Code for Mines in British Columbia.

<http://www.em.gov.bc.ca/Subwebs/mining/Healsafe/mxready/mxcode01.htm>

Canadian Mineral Exploration Health & Safety Awards

The Canadian Mineral Exploration Health & Safety Awards trace their roots to 1983 when the BC & Yukon Chamber of Mines (now AME BC) first recognized the commitment of mineral exploration companies active in British Columbia and Yukon to health and safety. The awards program was expanded nationwide for the year 2005 in cooperation with PDAC.

David Barr Award

In 2005, the AME BC Health & Safety Committee initiated the **David Barr Award in recognition of Excellence in Leadership and Innovation in Mineral Exploration Health and Safety**. Imperial Metals Corporation was the first recipient in 2006. Imperial Metals had also reported the largest number of lost workday incident free hours in British Columbia in 2005, and had previously won two Five-Year Safety Awards in 1992 and 2002.

Ian Paterson, Chair of the AME BC Health & Safety Committee from 2003 to 2007, received the award in 2007. As an exploration geologist with Cominco, Ian had a reputation as a leader in embracing health and safety awareness and procedures. In 2003, he accepted the position of Chair of the AME BC Health & Safety Committee, and through his leadership, the profile of Health & Safety in the mineral exploration sector in British Columbia increased dramatically. Ian's efforts as Chair led to initiatives such as annual Exploration Field Safety Awareness workshops and the fourth edition of *Safety Guidelines for Mineral Exploration in Western Canada*.

Safe Day Everyday Gold Award

The 2007 winner of the **Safe Day Everyday Gold Award** (formerly the Annual Safety Award) for the highest number of days worked without a lost workday incident is De Beers Canada Inc. for a second year in a row. De Beers reported 375,455 lost workday incident free hours (37,546 days), up from 257,235 hours in 2006. The Exploration Division of De Beers Canada is proud of its integrated Safety, Health & Environment Management System, which is ISO 14001 certified, and E3 and OHSAS (Occupation Health & Safety Advisory Services) 18001 compliant. De Beers performs external compliance audits on the majority of its operations annually.

The runners-up are Alexis Minerals Corporation, which reported 46,050 lost workday incident free days (hours were not available), and Northgate Minerals Corporation, which reported 334,772 hours (40,231 days).

FNX Mining Company Inc., who won the award in 2005, continued to report a lost workday incident free record through 2007.

Safe Day Everyday Award

The **Safe Day Everyday Award** (formerly the Exploration Safety Award) is presented to 65 companies for operating without a lost workday incident throughout the year, up from 61 in 2006, but down from 71 in 2005. There are 27 repeat winners, a significant increase from 17 repeat winners in 2006. Eight of last year's repeat winners were winners for a third year in 2007. AME BC and PDAC congratulate the winners.

The 2007 Award Recipients are as follows:

Adroit Resources
 Alexandria Minerals Corporation (2)
 Alexis Minerals Corp.
 Amarc Resources Ltd. (2)
 Appleton Exploration Inc.
 Aurum Geological Consultants (2)
 Avalon Ventures Ltd. (2)
 Azimut Exploration Inc. (3)
 Bell Copper Corporation
 BHP Billiton (2)
 Blue Pearl Mining Inc.
 Bootleg Exploration Inc. (3)
 British Columbia Geological Survey (2)
 CanAlaska Uranium Ltd.
 Caracle Creek International Consulting Inc.
 Carlisle Goldfields Limited
 Columbia Yukon Explorations Inc. (2)
 Constantine Metal Resources Ltd.
 Copper Ridge Explorations Inc.
 Dajin Resources Corp
 De Beers Canada Inc. (2; Gold Winner)
 Delisle Exploration Services
 Eastfield Resources Ltd. (3)
 First Metals Inc.
 First Nickel Inc.
 Fjordland Exploration Inc.
 FNX Mining Company Inc. (3)
 Geological Survey, Newfoundland and Labrador (2)
 Goldbrook Ventures Inc.
 Gossan Resources Limited
 Great Western Minerals Group Ltd. (2)
 Hy-Tech Drilling Ltd.
 Kennecott Canada Exploration Inc. (2)
 MacDonald Mines Exploration Ltd.
 Maximus Ventures Ltd.
 Messina Minerals Inc.
 New Millennium Capital Corp.
 Noront Resources Ltd.
 Northern Star Mining
 Northgate Minerals Corporation (2)
 Nova Scotia Department of Natural Resources
 NovaGold Resources Inc.
 Pacific Booker Minerals Inc. (3)
 PBG Geoscience (2)
 Peace River Coal

Premier Gold Mines Ltd.
 Rambler Metals and Mining Canada Ltd.
 Redcorp Ventures Ltd.
 Rimfire Minerals Corporation (3)
 Savant Explorations Ltd.
 Seel Enterprises Ltd. (2)
 Sego Resources Inc.
 St. Eugene Mining Corp
 Strateco Resources Inc. (2)
 Target Exploration & Mining Corp.
 Thundermin Resources Inc. (2)
 Tri Origin Exploration Ltd. (2)
 United Reef Limited
 Virginia Mines Inc.
 Vismand Exploration Inc. (3)
 Watts, Griffis and McQuat Limited (2)
 West Timmins Mining Inc. (2)
 Western Troy Capital Resources Inc. (3)
 Xstrata Zinc
 Yukon Geological Survey

(2) represents 2 years without a lost workday incident.

(3) represents 3 years without a lost workday incident.

The following companies have operated lost workday incident-free in British Columbia and Yukon for at least four years:

Pacific Booker Minerals Inc. (6 years)
 Rimfire Minerals Corporation (4 years)

Appendix: Canadian Mineral Exploration Health & Safety Questionnaire

Canadian Mineral Exploration Health & Safety Survey – available online at www.amebc.ca/safety_survey.htm

1



Canadian Mineral Exploration Health & Safety Survey 2007

In completing this form please note the following:

- The form should be completed by junior companies, major companies, government geological surveys, diamond drilling contractors, geophysical contractors, and any other companies or contractors carrying out exploration related activities in Canada.
- We ask companies to submit in the spaces below a close estimate of the number of person days worked in 2007 by company employees and contractors for the following:

- a) Surface exploration and geological field work which includes line-cutting, geophysical, geochemical, trenching, etc.
- b) Surface drilling
- c) Underground exploration including underground drilling, mining, and geological work

Please include the names of contractors so that we do not duplicate information. These names will not be published.

- Complete all the required fields, (*) indicates required fields
- If you have any questions about the form please contact Jonathan Buchanan at 604-689-5271 ext 225 or jbuchanan@amebc.ca.
- All information will be kept confidential, and Personal Information Protection and Electronic Documents Act mandates will be maintained.

Name of Person & Company Responsible for Safety (*Required Fields)

*Name:			
*Title:			
*Company Name:			
E-mail:			
<u>Address Information</u>			
Phone:			
*Street Address:			
Street Address 2:			
*City:			
*Province/Territory:		Postal Code:	
*Does your organization have a Health and Safety Program: Yes ___ No ___ *Does your organization discuss safety at staff meetings or hold safety meetings? Yes ___ No ___ *Do you discuss recent near misses at staff meetings? Yes ___ No ___			
*Reporting Period:	2007		

Please complete and return by fax to Jonathan Buchanan, AME BC at 604-681-2363 or by mail to AME BC, Suite 800, 889 West Pender Street, Vancouver BC V6C 3B2

Canadian Mineral Exploration Health & Safety Survey – available online at www.amebc.ca/safety_survey.htm

2

Company:			
Names of Contractors:			
Provide total Person – Days worked (e.g. number of employees multiplied by number of days worked) in each province or territory for both employees and contractors			
Worksite Location 1:	Prov./Terr.	Days worked:	PERSON DAYS WORKED EMPLOYEES CONTRACTORS
	_____	a) Surface exploration and geological work:	_____
		b) Surface drilling:	_____
		c) Underground exploration:	_____
Worksite Location 2:	Prov./Terr.	Days worked:	PERSON DAYS WORKED EMPLOYEES CONTRACTORS
	_____	a) Surface exploration and geological work:	_____
		b) Surface drilling:	_____
		c) Underground exploration:	_____
Worksite Location 3:	Prov./Terr.	Days worked:	PERSON DAYS WORKED EMPLOYEES CONTRACTORS
	_____	a) Surface exploration and geological work:	_____
		b) Surface drilling:	_____
		c) Underground exploration:	_____
Worksite Location 4:	Prov./Terr.	Days worked:	PERSON DAYS WORKED EMPLOYEES CONTRACTORS
	_____	a) Surface exploration and geological work:	_____
		b) Surface drilling:	_____
		c) Underground exploration:	_____

If additional space is required attach additional copies

Did you experience any incidents (either lost-time or without lost-time)?

*Yes__ No__

*If YES, please complete the following form.

Please complete and return by fax to Jonathan Buchanan, AME BC at 604-681-2363 or by mail to AME BC, Suite 800, 889 West Pender Street, Vancouver BC V6C 3B2

Corporate and personal information will not be published

If additional space is required attach additional copies.

Date (m/d/yy)	Location	Prov/Terr	Occupation	Type	Lost Time (in days)	Nature of Injury	Cause of Injury	Description (include factors such as experience, training, time of day that may have contributed)	Action Taken

Occupation:
 1-Driller
 2-Driller Helper
 3-Miner
 4-Geologist
 5-Field Assistant
 6-Geophysicist
 7-Line Cutter
 8-Surveyor
 9-Cook
 10-Other

Type:
 1-NM (near miss)
 2-FA (first aid)
 3-MA (medical aid)

Nature of Injury:
 1-Sprain
 2-Cut
 3-Skeletal Injury
 4-Bruise/Muscular Injury
 5-Allergies
 6-Substance Abuse
 7-Frostbite
 8-Eye Injury
 9-Chemical or
 Burn/Scald

**10-Pre-existing
 Illness/Seizure**
 11-Back Injury
 12-Fatality
 13-Other
 14-None

Cause of Injury:
 1-Slips/Falls
 2-Airplane
 3-Helicopter
 4-Snowmobile
 5-Automobile
 6-Improper Lifting
 7-Falling Objects
 8-Drilling Machinery
 Related

**9-Camp Equipment
 Related**
 10-Weather
 11-Chemicals
 12-Other

Date: _____, 2008

Company: _____

Please complete and return by fax to Jonathan Buchanan, AME BC at 604-681-2363 or by mail to
 AME BC, Suite 800, 889 West Pender Street, Vancouver BC V6C 3B2

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BHP Billiton
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First Nickel Inc.
Fjordland Exploration
FNX Mining Company Inc.
Goldbrook Ventures Inc.
Gossan Resources Limited
Great Western Minerals Group Ltd
Hard Creek Nickel Corporation
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Rambler Metals and Mining Canada Ltd.
Redcorp Ventures Ltd.
Rimfire Minerals Corporation
Sabina Silver Corp.
Savant Explorations Ltd
Seel Enterprises Ltd
Sego Resources Inc.
Selwyn Resources Ltd
Serengeti Resources Inc
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StrataGold Corporation
Strateco Resources Inc.
Target Exploration & Mining Corp.
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Teck Cominco Limited
Terrane Metals Corp
Thundermin Resources Inc.
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